Annual Reports for 1949-51 of the Smallholders' Advisory Service of the Rubber Research Institute of Malaya

RUBBER RESEARCH INSTITUTE OF MALAYA
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PREFACE

IT HAS BEEN THE CUSTOM to publish annually the reports of the several Divisions of the R.R.I. together with an introductory survey by the Director.

During the period of recovery after the war, publication of progress reports was delayed. The reports of the Divisions from September 1945 to the end of 1948 were issued as a single publication. Separate publications on specific subjects of research have continued to appear as Communications to the Journal of the R.R.I., but formal Annual Reports have not been published.

Postwar plans for research and development have crystallised and have been formally embodied in the Malayan Rubber Fund Five Years Plan 1949-53. The work of the R.R.I. since 1948 may therefore be reviewed, relative to the general research programme laid down for the five years.

These three reports are among a number which together will constitute a general report for 1949-51. The whole may thus be regarded as an interim report on the workings of the five years plan. The Reports for 1949 and 1950 of the Smallholders' Advisory Service are presented, together with a second edition of the Report for 1951, revised to bring it into line with the others.

Director

SMALLHOLDERS' ADVISORY SERVICE 1949

RUBBER RESEARCH INSTITUTE OF MALAYA
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CONTENTS

	Page
STAFF AND ORGANISATION	4
FIELD AND ADVISORY WORK	9
TAPPING	9
MANUFACTURE	9
CURING	11
AGRONOMY	11
DISEASES AND PESTS	12
PLANTING AND REPLANTING	13
PLANTING MATERIAL	16
REPLANTING DEMONSTRATIONS	19
OTHER DEMONSTRATION WORK	20
BUDGRAFTING IN KELANTAN	21
R.R.I. SMALLHOLDING	22
PUBLICATIONS AND FILMS	23
Appendix	
PROVISION OF PLANTING MATERIAL	24

Headquarters — Mr E.G.B. Gooding continued to act as Smallholders' Advisory Officer until 5 March when Mr L.R. Davidson resumed duty on his return from long leave. Mr J.M.F. Greenwood was on duty throughout the year.

Superintendent Rubber Instructors — 'Che Mohd Aris, Superintendent Rubber Instructor, Johore, was appointed a member of a rubber commission to North Borneo and was absent in North Borneo and Sarawak during February and until the middle of March. 'Che Hussein, Superintendent Rubber Instructor, Perak, was transferred to act in Johore during this period. 'Che Mohd Aris was on long leave from 14 June till 10 October. 'Che Shamsuddin bin Mohd Arabee was appointed Acting Superintendent Rubber Instructor, Johore, during the period of his absence. The three Superintendent Rubber Instructors were all on duty at the end of the year.

Rubber Instructors — We have to record with regret the death on 6 December of 'Che Sa'ad bin Musa, Rubber Instructor, Temerloh.

'Che Shamsuddin bin Yub Ahmad left Malaya on 8 September for the United Kingdom to take up a Colonial Development and Welfare Scholarship at Queen's University, Belfast, to read for the Bachelor of Science degree in Agriculture.

One Malay Rubber Instructor resigned during the year and one Chinese Rubber Instructor was obliged for health reasons to relinquish his appointment.

Transfers effected during the period were: Mr Chai Hon Chee from Segamat to Klang in March (on completion of a short period of duty at the Experiment Station); 'Che Mohd Shafii from Rembau to Klang in May; 'Che Mohd Piah from Kuala Kangsar to Seremban in May; 'Che Ramli from Parit to Kuala Kangsar in September; 'Che Shamsuddin from Klang to Baling in October (on conclusion of his duties as Acting Superintendent Rubber Instructor, Johore); and 'Che Zakaria from Kuala Pilah to Tapah in October.

In making these transfers and in posting new Rubber Instructors, consideration has been given to reallocation of the areas and centres of operations according to the needs of the districts and the promise of progressive work among the rubber smallholders in different parts of the country.

New Appointments — Eight new appointments were made in May and these included four Malays, one Chinese and one Indian who had just completed the diploma course at the College of Agriculture. Two Chinese who had obtained their diplomas in earlier

years and had subsequently gained experience on rubber estates were also appointed. The new Rubber Instructors each spent a period of two or three weeks with an experienced Rubber Instructor becoming acquainted with the general nature of their duties. A training course was arranged for them at the Experiment Station during June and they subsequently returned to Sungei Buloh in November to obtain further experience in nursery work and field planting.

In July the new appointees were posted to their first stations as follows:

Mr A.G. Mak	Segamat
Mr Lim Kheng Hoe	Batu Pahat
Mr A.T. Rajah	Ipoh
Mr Lee Chin Khoon	Lumut
'Che Ahmad b Lebai Salleh	Rembau
'Che Abdul Kalid bin Awang Osman	Kajang
'Che Mohd Khir bin Hashim	Parit
'Che Osman bin Ismail	Kuala Trengganu

Three Rubber Instructors were assigned for duty at the R.R.I. Experiment Station for a total period of five months; a short period of duty at the Experiment Station is valuable in keeping Rubber Instructors abreast of recent developments. It is hoped to resume shortly the pre-war practice of assigning each Rubber Instructor in rotation to the Experiment Station for about three months.

A special course of training in handling and processing latex in large quantities was provided for one Rubber Instructor who spent three weeks obtaining experience of all phases of the work at the Rubber Research Institute, the R.R.I. Experiment Station and at Glugor Estate in Kedah. This Instructor will be available to assist his colleagues in districts where there are good prospects of establishing a central factory for smallholders' latex.

There were thirtynine Rubber Instructors at the end of the year and the strength of our field staff was above the maximum of 1941. Further expansion must be delayed until 1951 because the diploma course at the College of Agriculture is being extended to three years.

Rubber Demonstrators — The terms for employment of Rubber Demonstrators were modified during the year. It is now our policy to engage for these posts only young men in their early twenties and preferably the sons of smallholders. On the satisfactory completion of probation, engagements are confirmed for two

years. While re-engagement will be considered for those who desire continued employment after two years' service, it is hoped that this period will serve as training which will enable a young man to return and apply his knowledge and experience on his own or a relative's holding, or to obtain more remunerative employment in a position of greater responsibility.

Two training courses of a fortnight each were held at the Experiment Station and a total of twentyfive Rubber Demonstrators were able to attend. This means that the majority of our Demonstrators other than those on the east coast now have had the opportunity of attending such courses.

During the year Malay Rubber Demonstrators have in four instances been working under the supervision of Chinese Rubber Instructors. This is proving a satisfactory means of extending our work among Malay smallholders in districts where we have no Malay Instructor. Such associations in work may be very valuable: the Chinese Instructor widens his experience from work on a category of holding which is less common with his own race, while he brings a fresh outlook to the problems of the Malay smallholder.

Three Rubber Demonstrators resigned during the year and three were dismissed or failed to obtain confirmation of engagement after the probationary period. Fourteen new Demonstrators including two Chinese and one Indian were engaged during the year; the total number of Demonstrators at the end of the year was fortythree.

VISITS BY SENIOR OFFICERS TO RUBBER INSTRUCTORS

Visits by the Smallholders' Advisory Officer and the Assistant Smallholders' Advisory Officer during 1949 were:

Selangor	March, September
Negri Sembilan	January
Malacca	July, September
Perak	March, October, November
Johore	February, July
Pahang	August
Kedah & Perlis	March, April, October
Penang & P. Wellesley	March, April, October
Kelantan	August
Trengganu	August

COURSE ON RUBBER AT THE COLLEGE OF AGRICULTURE

Four Rubber Instructors, Mr Lee Yew Siong, 'Che Kassim, 'Che Mohd Razalli and 'Che Mohd Rouse, assisted the staff of the College of Agriculture in arranging a special course of a fortnight's duration on rubber. Instruction was given to both diploma and certificate students, who also visited the Rubber Research Institute and Experiment Station.

RUBBER INSTRUCTORS' CONFERENCE

All Superintendent Rubber Instructors and Rubber Instructors attended a conference at the Rubber Research Institute, 8-10 December. Guests who took part in various sessions of the conference included the Acting Director of Agriculture, the Director of Cooperation, the Director of the Department of Public Relations, the Director of the Malayan Film Unit, the Chief Field Officer of the Department of Agriculture and the Deputy Director of Cooperation. Tuan Sheikh Ahmad bin Sheikh Mustapha and Mr Fong Yeok Seng, the smallholders' representatives on the Board of the Rubber Research Institute, attended the opening session.

During the course of the domestic sessions of the conference the field of rubber cultivation and processing was widely covered and discussion ranged over the present position of natural rubber in world economy and the implications for the smallholder. Replanting, new planting, cultivation and maintenance procedures and developments in organisation for processing were given particular attention. The various subjects, treated in talks by nominated Rubber Instructors, served as a stimulant to general discussion and valuable exchanges of views. During the conference visits were arranged to the Experiment Station and to the Institute's smallholding at Ampang, for all Instructors to inspect field work of particular interest.

The conference was entertained during an evening session by a film 'Jalan Yang Sa-Benar', which showed the benefits to be obtained from cooperative production and marketing of rubber. This film was produced by the Malayan Film Unit, who also arranged the screening by courtesy of Mr H.W. Govan, Director. Mr Govan attended, and gave a most interesting talk on the use of films in instructional work.

SMALLHOLDERS' RUBBER ADVISORY COMMITTEE

The eighth meeting of the Smallholders' Rubber Advisory Committee was held at the Institute in October when the estimates of expenditure for the Smallholders' Advisory Service for 1950 were considered. Modification in the method of presentation of the estimates was agreed. This has the object of showing as clearly as possible the division between instructional and investigational work.

Other subjects discussed at this meeting included the problems of improving the quality of smallholders' rubber and the value of centralisation of processing, the need for closer collaboration between the Cooperative Societies Department and the Smallholders' Advisory Service, the scheme for provision of approved planting material for smallholders and the need for more information on the economics of smallholders' production of rubber. In connection with the latter a brief outline was given of proposals for a sample survey of yields on rubber smallholdings in Johore. The Committee while approving this project were of the unanimous opinion that a full investigation of the economics of rubber production by the smallholder is required and that such an investigation could only be initiated if sponsored by the Government.

Sample Survey of Yields on Smallholdings in Johore — Proposals put forward by Ungku Aziz b Abdul Hamid a member of the staff of the Economics Department of the University of Malaya, for an investigation into the yield of rubber smallholdings in Johore, have been the subject of correspondence and discussion. There was general agreement on the need for such work and on the method of carrying it out and at the end of the year satisfactory arrangements had been made for a joint project in which the Economics Department of the University of Malaya, the Department of Agriculture and the Rubber Research Institute of Malaya would participate.

Plans have been prepared for the establishment of a random sample of rubber smallholdings in all rubber producing mukims in Johore where present conditions permit normal working. The sample will consist of approximately 1,000 holdings in groups of five each in about 40 mukims.

Field work in connection with the survey, which involves the identification of holdings from random selection and reference to land books and the regular collection of evidence of monthly sales of rubber from the holdings, will be carried out by field staff of the Smallholders' Advisory Service and of the Department of Agriculture in Johore.

FIELD AND ADVISORY WORK

TAPPING

The general trend of rubber production from smallholdings during the year has again emphasised the part that high price plays in encouraging greater intensity of tapping on smallholdings. The price of rubber was generally low during the first six months of the year and production from smallholdings was then lower than in any half year period since 1946. With the gradual rise in price during the second half of the year, rubber production from smallholdings increased.

While emergency conditions have produced unsettling effects on rural workers at certain times in different places, and the emergency generally has reduced the efficiency of the country's tapping force on smallholdings through the recruitment of young men to the security forces, the whole effect on rubber production on smallholdings during the year has probably been slight.

With Rubber Instructors concentrating attention on planting and processing, intensive effort to improve the standard of tapping by smallholders has been limited to areas planted in the few years preceding the war in Malaya. These areas under the observation of Rubber Instructors amount to about 30,000 acres and are planted mainly with improved material.

MANUFACTURE

Favourable opportunities to test and demonstrate new organisations for the processing of smallholders' latex arose during the year.

With the cessation of the latex purchasing scheme in Central Kedah, foreshadowed in the 1948 report, a satisfactory organisation was established at Kampong Batu Hampar for the manufacture of smoked sheet. This small factory handled smallholders' latex from an area of about 500 acres in the Mukim of Merbok. The project at Kampong Batu Hampar has been described in the *Journal of the Rubber Research Institute of Malaya* Volume 12, Communication 268.

Further developments in Central Kedah have served to demonstrate the possibility of handling smallholders' latex from extensive areas in large scale central factories able to utilise latex for the production of a variety of products according to the quality of the latex and market requirements. Through the collaboration and enterprise of the management of Glugor Estate near Sungei Patani, collection of latex from extensive areas to a series of collecting points along the Baling Road was made possible. The collecting points were organised by subagents of a large scale Chinese

rubber buying organisation which arranged the motor transport necessary for collection of the latex, and secured the assistance of the management of Glugor Estate to process the latex into sheet or crepe of high quality. By October the collections were averaging nearly 3,000 lb dry rubber per day and further expansion was indicated as desirable by the eagerness of smallholders in the area to sell their latex. Arrangements were therefore made by the purchasers to divert a large part of the latex to Messrs Malayan American Plantations Ltd, who wished to obtain increased supplies for the manufacture of concentrated latex.

In the final stage of this development the purchasing agency was in the happy position of being able to send the greater part of their latex supplies to the latex concentrate producer while latex not suitable for processing into concentrate could be diverted to Glugor Estate for manufacture into first quality sheet or crepe. Without such alternative processing facilities the large scale purchase of smallholders' latex solely for latex concentration may be hazardous because of the rigid high standards of d.r.c. and quality required by the exporter of liquid latex. Under kampong conditions it is extremely difficult to ensure that such standards can be maintained at all times and in all weathers.

The demands on our advisory service in the development of this organisation have been heavy. Operators at collecting points have had to be instructed and continually checked in the use of the hydrometer and sample coagulation methods for estimating d.r.c. The alternative uses of there anticoagulants, ammonia, formaldehyde and sodium sulphite, according to weather conditions and the destination of the latex, have required careful explanation. In addition intensive work in the kampong areas has been necessary to ensure that owners and tappers supplying latex to the scheme would appreciate the need for cleanliness at all stages in production.

In other parts of the country a few projects have developed on similar lines to the Kampong Batu Hampar factory. These have been started usually by small groups of dealers occasionally associated with the more influential rubber growers in the area. Smallholders have not shown any marked enthusiasm to develop on their own initiative cooperative enterprises for processing latex. Only at Kampong Tallang near Parit, where material assistance has been provided, are the prospects of cooperation in rubber manufacture good. The narrowing of the price margin between grades of rubber which was apparent with the general rise in the price of

rubber during the latter part of the year removed one of the strongest inducements to centralisation of processing. Nevertheless, wherever smallholders have once arranged to dispose of their crop as latex they have shown no desire to revert to the manufacture of sheet individually. Opposition to the principle of centralised manufacture comes generally from contract or share tappers who wish to have the maximum control of the crop.

CURING

Our efforts to encourage cooperative processing of rubber by the erection of trial smoke houses in suitable areas were referred to in the 1948 report. These received a severe set back when the smoke house at Sungei Chinchin was burnt with its rubber contents in February. Of three temporary type smoke houses built in Selangor this had been the only one to come into operation and it was disappointing that the people, who had obtained the benefits of producing first class smoked sheet and selling direct to the exporter during eight months, showed no desire to rebuild the smoke house.

The possibility of obtaining insurance cover for the smoke house at Sungei Chinchin had been examined in 1948. Because of the vagueness of ownership of a smoke house constructed by a group of people, an insurance company would have been unable to issue a policy and it had been hoped that the formation of a Registered Society, which the Cooperative Marketing Officer was anxious to obtain in this district, would have made insurance possible.

AGRONOMY

Attention to maintenance work on smallholdings fluctuates with the price of rubber; increased prosperity stimulates smallholders to bouts of slashing and weeding in their old rubber areas, and then the greatest counter effort is required from an advisory service. Such practices on smallholdings result in erosion, and appear to spring from pride of ownership. The Chinese with his preference for the heavy hoe is a greater danger to the land than the Malay who uses a parang. The latter technique can be improved by attention to height of slashing and discrimination between desirable and undesirable cover plants.

Our efforts have been directed to the encouragement of systematic and selective control of naturally occuring plants in both old and young rubber areas with proper attention to strip weeding

in the latter. Only where land has been completely exposed as by the eradication of lalang or the cessation of cultivation of vegetables is it considered justifiable to aim at the establishment of creeping leguminous covers.

Dense infestation of areas with lalang provides one of the most difficult problems for rubber growing smallholders. Sheet lalang is found mainly in young rubber plantings and on land where the old rubber was felled during the occupation. On such land successful replanting is unlikely to be accomplished without preliminary removal of the lalang. Digging of the lalang is only likely to be undertaken if an immediate return from foodcrops can be obtained but it is unfortunate that many of the lalang areas are abandoned food producing areas in which the fertility has been lowered by cropping and good vegetable crops could not now be obtained without heavy manuring.

Spraying with sodium arsenite, at present the cheapest effective method of eradicating lalang, can now rarely be undertaken by smallholders because they are unable to obtain the permit required under the law, Poison (Sodium Arsenite) Ordinance of 1949. It is particularly difficult for smallholders to comply with the regulations governing storage of poison, and the spraying with arsenite of areas to which children and animals have free access is clearly dangerous.

Progress has been made in the restoration of drainage in coastal districts of Johore with consequent benefits to rubber smallholdings. Considerable improvement in the main outlet drains has been effected in many areas and this has been supported by communal work by smallholders to improve the drainage of their own areas. On the lower reaches of the Perak River, however, there remain many areas of deteriorated rubber which have been affected by flooding.

DISEASES AND PESTS

The proper treatment of diseases of the rubber tree remains the most difficult subject on which to secure the acceptance and execution of our advice by smallholders. The use of fungicides for control of mouldy rot provides an interesting example. In spite of information supplied on the relative effectiveness of the different brands and their cost, a large proportion of the smallholders who treat mouldy rot at all continue to purchase those proprietory fungicides which are most expensive to use and not the most effective in their action.

PLANTING AND REPLANTING

Acreages of new planting and replanting in the different States & Settlements, as observed by Rubber Instructors, are recorded in TABLE III *S.H.A.S.*: '51. The acreage of replanting for 1949 shown at the end of the 1951 report includes an area of 1388 acres which had been felled during the Japanese occupation.

At the end of 1949 we have recorded the replanting of slightly less than 6,500 acres out of the total 28,338 acres* of smallholding rubber felled during the occupation. The field staff of the Smallholders' Advisory Service is not yet strong enough to cover all districts of the country in sufficient detail and it is likely that some areas of replanting have not been recorded. There can however be little doubt that 70% of the rubber areas felled on smallholdings between 1942 and 1945, as recorded in the statistics, have not been replanted.

No attempt has been made to classify unplanted areas systematically or to assess the reasons why such a large proportion has not been replanted with rubber. Some suggestions for the failure of smallholders to replant more of the felled areas were advanced in the 1948 report, but more factual evidence is likely to result from the detailed work of the War Damage Claims Commission when investigation and assessment of claims commences. Smallholders in most parts of the country have shown a keen interest in new land for rubber planting which should account largely why these old felled rubber areas have not been replanted.

Although the total acreage of new planting and replanting on smallholdings during the past three years has been small there are encouraging indications from the 1949 figures of a trend towards increased planting on the smallest category of holding. An analysis of the acreages of planting, according to size of holding (less than 10 acres, 10 – 25 acres or 25 – 100 acres) has been possible and equivalent figures are available for 1948. The percentages of the total in each category are:

	REPLANTING		NEW PLANTING	
	1948	1949	1948	1949
Less than 10 acres	47%	59%	60%	83%
10 – 25 acres	10%	14%	13%	7%
25 – 100 acres	43%	27%	27%	10%

When considering the percentage in each of the above area categories, it must be appreciated that the total land owned by any

* *Malayan Statistics Handbook*

one individual may not be known, so that the figures refer to the actual areas newly planted. Furthermore these figures are affected by land alienation procedure and so do not necessarily indicate the true trend in demand for land for new planting. As the smallest holdings (of the less than 10 acres category) comprise the major part of the total smallholding acreage of the country this trend towards increased replanting of the smaller holdings is of considerable importance.

The value of replanting is generally appreciated by smallholders and progress has been slow mostly for economic reasons. It is a considerable sacrifice for a smallholder to cut out trees which are yielding a steady income however small. The income can only be made good by extra labour over and above the need for developing and maintaining his replanting. Even if this sacrifice can be made, or if the trees are so old that they will yield no return the smallholder is still confronted with the heavy task of disposing of the old stand of rubber trees. This is the biggest single operation in replanting and one which may involve the owner-occupier-worker, equiped with axe and saw, in a hundred days of heavy labour for every acre, even if the work is done only roughly, without consideration for the dangers of root disease.

Where a smallholding is easy of access and reasonably close to a market for firewood it is possible for the owner to secure the replanting of his area from the sale of the trees. But unfortunately, the purchasers of trees fell them by the cheapest method. Stumps are left in the ground and as sources of root disease infection, constitute a menace to the replanting over a long period. The smallholder is generally prevented, by the regulations governing the use of sodium arsenite, from taking the possible and inexpensive precaution of poisoning the stumps immediately after felling. In these circumstances it would be advisable for the smallholder to forgo some of the value of the rubber trees as timber to insist on a contractor felling his trees by means of a winch so that all stumps and much of the roots would be removed. Such advice has not been taken.

It is however in remote areas that smallholders have the greatest difficulty in disposing of the old rubber stand. There are many such, where dwelling houses are concentrated in small hamlets at some distance from the rubber plantings, which are not therefore frequented by children or animals. In these areas poisoning of trees by the ringbarking method would be a satisfactory undertaking could the requirements for storage of the arsenite be met. Cost of poisoning using sodium arsenite would be in the region

of $15 per acre as compared with 100 man-days work for rough felling. There are therefore strong reasons for investigating all possible means to enable smallholders to use this method of tree poisoning.

Although the search continues for alternative poisons comparable with sodium arsenite in cost, no satisfactory substitute has yet been found. Meantime it has been suggested that the Government might employ teams of trained tree poisoners whose work would be organised to meet all legislative precautionary measures. The cost of the services of trained teams could be offset by a small charge.

Before replanting is carried out on the scale necessary for the maintenance of production from smallholders' rubber lands, the economic problem of subsistence of the owner and his family during the period of non-production of the rubber must be solved. If smallholders are to be encouraged to replant, then advice on replanting of rubber must be accompanied by sound advice on the use of land to provide continuous income while the new rubber trees advance to maturity. Vegetable cropping offers one possible source of income but the market for vegetables in the main rubber smallholding districts is limited. Also it is clear that only a small portion of a holding could be maintained by the owner in the required condition of intensive cultivation. Furthermore a large part of the smallholding rubber land is unsuitable for food crop cultivation.

The system of planting rubber trees close together in widely spaced 'hedges' may provide a useful aid to replanting for smallholders. For a given area and number of trees planted, hedge planting results in the minimum effects of shade and root competition from surrounding old rubber trees. This system also facilitates the cultivation of other crops along with the rubber trees for a considerable number of years, and this may be of importance to the economy of the smallholders. Experience of hedge plantings at maturity is admittedly limited and none has yet been obtained in Malaya. Nevertheless the indications are clear that satisfactory growth and yields can be got from areas planted in hedges, providing the number of trees per acre is adequate. Since the need for replanting is urgent for many smallholdings, and since hedge planting may offer a special contribution to the solution of the particular problems of smallholders, it is considered that the critical evaluation of the production of hedge planted areas in comparison with conventional plantings over a long period is not of the same

importance to smallholders as to the larger estates. We are therefore taking steps to encourage the adoption of hedge planting systems as a means to secure the replanting of smallholdings which might not otherwise be undertaken. Warning is always given of the possible limitations of the method; meanwhile information is being obtained from hedge planted areas on the Rubber Research Institute Experiment Station, the Rubber Research Institute Smallholding and on a number of holdings throughout the country.

PLANTING MATERIAL

The scheme to provide planting material for smallholders in the form of budwood and clonal seedling stumps received final approval for finance by a grant from Colonial Development and Welfare Funds as Scheme D.1176. Provision has been made for the establishment of budwood multiplication nurseries and clonal seedling nurseries at Agricultural Stations throughout the country, with a central nursery at Sungei Buloh under the management of the Manager of the R.R.I. Experiment Station. These areas total 275 acres. A note on the organisaion of Scheme D.1176 is given in the *Appendix* after this report.

Budwood nurseries had been established on Agricultural Stations before the war and these were generally able to meet smallholders' demands for budwood during the year. Surplus budwood is available in most States and Settlements and only in Kelantan and Trengganu has there been any indication of insufficient local supplies of budwood of approved clones.

Up to the limit of available funds, steps to implement the provisions of the scheme for supplying clonal seedling stumps to smallholders had already been taken in 1948. Supplies of seed had been organised for distribution to Agricultural Stations and Sungei Buloh, so that limited quantities of stumps were available for supply to smallholders within a very short time of official sanction being received for the continuance of the scheme. So too, sources of supply of approved clonal seed were available as a result of a survey undertaken by the Botanical Division (Mr H.M. Burkill) in 1948 and the early part of 1949. It was unfortunate that approval for the scheme was received only in August, so that full advantage could not be taken of the best seeding season. Many of the nursery areas provided under the scheme were not developed before the end of seed fall in the second week of October.

Acreages of budgrafting and the area planted with clonal seedlings on smallholdings under the observation of Rubber Instructors during 1949 are recorded in TABLE I.

TABLE I: USE OF HIGH YIELDING PLANTING MATERIAL

State or Settlement	*Acres budgrafted*	*Acres planted with clonal seedlings*
Selangor	278	169
Negri Sembilan	73	191
Malacca	305	117
Perak	196	217
Johore	395	66
Pahang	10	170
Kedah & Perlis	42	86
Penang & P. Wellesly	88	52
Kelantan	76	–
Trengganu	17	22
Total	1,480	1,090

The use of improved planting material on different categories of holding is:

		Budding	*Clonal seedling*
Replanting	less than 10 acres	461	505
	10 – 25 „	128	84
	25 – 100 „	190	80
New planting	less than 10 „	484	258
	10 – 25 „	180	43
	25 – 100 „	37	120
	Total	1,480	1,090

Total planting recorded by Rubber Instructors since the (re-occupation) up to the end of 1948 amounted to over 8,000 acres. Practically none of this was planted with clonal seedling material of approved origin and therefore most of it ought to be budgrafted. In addition there are large acreages of illegally planted rubber and if these are to be retained they also should be budgrafted. Total budgrafting in 1948 and 1949 covers only 2,844 acres. This represents a considerable effort on the part of Rubber Instructors but it cannot be considered satisfactory against the background of total planting.

Smallholders frequently depend on Rubber Instructors to assist them in obtaining delivery of supplies of budwood. As this service results in advice being taken it is important even if it is inappropriately assumed. The supply of budwood to rubber growing districts lacking good road access is an arduous task and lack

of easy supplies of budwood may cause the smallholder to be indifferent to budding, or he may be careless of rebudding needs where small quantities only are required and these do not appear to justify a lengthy journey to the Agricultural Station. To try to overcome this difficulty trials have been made in Johore, with the State Agricultural Officer's assistance and encouragement, to persuade the more progressive and capable smallholders to establish their own multiplication nurseries. Such nurseries may be established in advance to provide for a smallholder's complete budding requirements, or they may be developed during the budding of an area and take the form of the budding of surplus seedlings between the planting rows. Ability to secure a few yards of budwood nearby has good effect in deciding a smallholder to budgraft, and nursery owners will be encouraged to dispose of excess supplies of budwood to neighbours subject to the approval of the nearest Agricultural Officer. Such nurseries are likely to be established only on the advice of a Rubber Instructor, who will be able to observe their development at regular intervals. It is thus possible to protect smallholders from the multiplication and sale of inferior material.

A complementary development of an exploratory nature is recorded at Kalumpang in Selangor. Here smallholders undertaking new planting under cooperative management are endeavouring to supply a large part of their planting material requirements as clonal seedlings grown in their own nurseries.

The distribution of limited supplies of clonal seed in 1947 led us to conclude that this form of planting material was not suitable for wide scale distribution to smallholders because almost without exception high wastage of valuable material occurred.

It is clear that smallholders have always been accustomed to plant their rubber by the stump planting method. The reasons are appreciated. When unselected seedling planting was the rule it was always possible to obtain sufficient seedling stumps either from self sown plants on established holdings, or from surplus supplies from nurseries on larger holdings. Smallholders have not generally gone to the trouble and expense of making germination beds and seedling nurseries. Furthermore the planting of germinated seed or basket plants in the field requires more care and expense in upkeep during the first year than a similar planting with seedling stumps. If only ungerminated clonal seeds are supplied to smallholders there is the obvious danger that deficiencies for planting might be made good by using easily procurable inferior material. Given the requisite organisation and leadership however

smallholders may be able to grow their own clonal seedling stumps.

At Kalumpang a land alienation scheme favourable for new planting of rubber was initiated by the District Officer. This brought to light a cooperative spirit on the part of a group of smallholders who wished to plant their land with clonal seedling stumps. At a time when supplies of this planting material were much short of the demand it was decided that the smallholders should be provided with approved clonal seed and assisted to grow their own clonal seedling stumps. The strong leadership of the Penghulu appeared to give such a policy a good chance of success. The scheme was given valuable practical assistance by the Department of Agriculture in Selangor and a rotary hoe was lent by an Agricultural Station to assist in the preparation of nurseries. The Rubber Instructor for Ulu Selangor has been responsible for supervising the development of the nurseries. The organisation was supplied with 56,600 clonal seed during September and October; these were carefully germinated and satisfactorily established in the nursery areas. Of the three acres prepared nearly two acres were planted with clonal seed; the balance had to be planted with ordinary seed to provide budded stumps. These nurseries should provide material for nearly 200 acres of field planting in 1950 and further expansion of the nurseries is planned. The success of this venture has depended much on the energy and initiative of the Penghulu.

REPLANTING DEMONSTRATIONS

We have continued to provide requirements promised for the maintenance and good development of replanting demonstration plots established in 1948, except for a few where the owners would not continue to cooperate. Further demonstration plots have been established in areas where examples appeared desirable to convince smallholders of the possibilities of replanting with high yielding material. Where four areas have had to be abandoned new demonstration areas have been obtained in the same localities.

To be of value demonstration plantings must indicate the feasibility of replanting to a large section of smallholders. The Institute's contribution is limited to the provision of material necessary for the best results, such as approved planting material and manures and the payment of labour for special operations when their value is doubted by the smallholders. These include boundary trenching to minimise root competition and terracing where

steep slopes are encountered. In selecting a smallholding for a demonstration replanting it is considered desirable to avoid the smallholder of more han average means; experience has indicated that the most satisfactory holding is that of a working family, where labour is assured for continued maintenance.

At the end of the year replanting demonstrations totalled eighteen distributed thus:

	Malay	Chinese	Indian	*Totals*
Selangor	4	1	1	6
Negri Sembilan	1	–	–	1
Perak	1	2	1	4
Kedah	4	–	–	4
Province Wellesley	1	1	–	2
Pahang	1	–	–	1
Totals	12	4	2	18

Our practice of establishing replanting demonstration only where very limited replanting or new planting is being attempted by smallholders accords with our deficiencies in staff. Where replanting or new planting has commenced on any scale our Rubber Instructors and Demonstrators are fully occupied in advising and assisting smallholders to make their planting successful.

OTHER DEMONSTRATION WORK

Each replanting successfully established and satisfactorily maintained with the advice of our staff is in effect a demonstration to neighbouring smallholders. As observed above, in several districts our staff are fully occupied affording assistance to those in greatest need. Much of the work done by Rubber Demonstrators is direct assistance in budgrafting, cutting back, pruning side shoots, and any other demonstration of improved practice.

Details of organisation of collection of smallholders' latex and processing in small central factories have been noted under MANUFACTURE. In several areas where developments in central processing of smallholders' latex have been initiated much demonstration and instruction has been required and further increase in this work may be expected in the future.

As in past years exhibits were arranged by Rubber Instructors for agricultural shows in their areas and in these attention was particularly directed to good practice in rubber planting and to the advantages of centralised processing of rubber.

BUDGRAFTING IN KELANTAN

A special effort in Kelantan is described because it represents an intensification of the normal day to day activities of Rubber Instructors and their Demonstrators necessitated by the special requirements and circumstances in the area.

Reference has been made under PLANTING MATERIAL to the possibility of shortage of budwood on the east coast, but a problem of equal importance was presented in the use of existing supplies in that area. In the rural areas of the east coast States where travel is difficult and the areas of improved rubber on large estates is relatively limited, the smallholders have not had the same opportunity to learn the value and use of improved planting material as have the people in the more intensively developed parts of the country. Opportunity was therefore taken of the intention to alienate over 100 acres of illegally planted land in the Pasir Mas district to organise an intensive budding campaign in an attempt to convince smallholders of the essential simplicity of the operation and to encourage the younger men to learn the art.

Our full strength in Kelantan and Trengganu, consisting of two Rubber Instructors and six Demonstrators, was assembled for the job and five trained budders who had worked on one of the Agricultural Stations were engaged. Additional assistance was provided by the temporary transfer of the Rubber Instructor from Kuala Kangsar who was familiar with the area and by the budding mandor of the Botanical Division, Rubber Research Institute.

The area at Bukit Kwong is reached from the railway line between Lubok Batil and Gual Periok by a sampan journey of three and a half hours or a walk of two hours, and the delivery of budwood therefore presented some difficulty. Neither were conditions for budding ideal as tree girths at the collar varied from 4 inches to 12 inches and natural covers subject to little control presented an obstacle to the workers. In the circumstances the successful budgrafting of 7,000 plants in 140 acres comprising 37 lots during a period of 10 days was a reasonable achievement. In the course of the work the owners of the land obtained some familiarity with the practice of budgrafting which it is hoped will enable them to complete any unfinished budding on their land. The full benefits of this extension project may not be obtained for six years or more when it may provide an example of high yielding budgrafts to a relatively isolated community.

R. R. I. SMALLHOLDING

With the occupation of the houses which had been built on the area on Ampang Road opposite the Rubber Research Institute we lost control of the small clone 'museum' and tapping of these trees ceased.

At the Ulu Klang holding the small amount of latex obtainable from the old seedling trees was utilized in the Chemical Division. Tapping of the two small blocks of budgrafts continued in the Botanical Division's experiment.

Further replanting was undertaken in Lot 683. The 'hedges' established in 1948 were extended to the lot boundary giving a total of 1¼ acres under hedge planting. The same principle was adopted as in 1948 of leaving three standing rows of old rubber between the rows which were replaced by hedges. The double lines of the hedges are 5 feet apart and the distance between trees in the row is 6 feet. Clonal seedling stumps were planted and the old trees were poisoned by ringbarking. The other half of Lot 683, separated from the hedge planting by three rows of Tj. 16 established in 1938, was replanted by poisoning the old trees after planting budded stumps at 15 feet × 16 feet on the level area and 22 feet × 11 feet on the ravine side. The use of the poisoning technique in this rather remote lot was unfortunate since it was taken as an invitation to the population in the surrounding area to fell the trees for firewood and much damage was done particulary to the young shoots on the budded stumps.

In December we commenced preparation of an area in Lot 707 for replanting in 1950. The plan in this area, where the old rubber trees are 18 feet apart, is to pollard two rows in every three and to stop tapping them while slaughter tapping is initiated in the third row. This slaughter tapped row will be felled and replanted with a close planted hedge towards the end of 1950, when tapping of the pollarded trees will commence. Pollarding of the intermediate rows was completed during December.

Budwood and clonal seedling stumps from our small nursery on the Ulu Klang holding were used for planting requirements on our smallholding and for demonstration plots throughout the country. The value of a nursery for this purpose and to provide easily accessible material for the divisions has been appreciated and a start was made on opening up and planting as a nursery a small area of land near the Rubber Research Institute.

PUBLICATIONS AND FILMS

WE HAVE COLLABORATED with the Department of Public Relations in the publication of a leaflet and a series of posters on the production of clean rubber by traditional smallholding methods. These are in Jawi.

A note on the method of construction of mud and wattle smoke houses, as observed by the Smallholders' Advisory Officer in Ceylon, was prepared for publication in the vernacular journals of the Department of Agriculture.

An account of the organisation and development of the small scale central factory for the processing of smallholders' latex at Kampong Batu Hampar has been written for publication as a Communication to the *Journal of the Rubber Research Institute of Malaya**. Publication of this material in vernacular languages will also be considered.

A series of leaflets to inform smallholders as fully as possible on the most important aspects and developments of rubber growing and production on small units has been planned and compilation of some of the leaflets commenced. It is hoped to publish these in suitable form in vernacular languages with the assistance of the Department of Public Relations.

Instructional Films — In collaboration with the Director and members of the staff of the Malayan Film Unit proposals were considered for a series of instructional films to cover the most important aspects of rubber growing and processing on smallholdings. During the year a synopsis was prepared of the technical field to be covered and the Malayan Film Unit produced a working script and an estimate of expenditure required for production.

Assistance was given to representatives of the J. Arthur Rank Organisation and of Verity Films Ltd in finding locations respectively for a film in 'This Modern Age' series and 'This is Rubber'. The latter is sponsored by the British Rubber Development Board.

L.R. DAVIDSON
Smallholders' Advisory Officer

Kuala Lumpur
3 November 1950

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PROVISION OF PLANTING MATERIAL FOR SMALLHOLDERS

A NOTE ON THE COLONIAL DEVELOPMENT & WELFARE SCHEME D.1176

A SCHEME EVOLVED from the pre-war preparations and plans for the organisation of supplies of planting material for smallholders was approved by the Secretary of State for the Colonies in August 1949 for finance from Colonial Development & Welfare Funds. Known as Colonial Development & Welfare Scheme D.1176 the plans provide for supply of approved rubber planting material to smallholders owning less than 25 acres of rubber land. The scheme aims at providing approved planting material for smallholders sufficient to secure the establishment each year of 50,000 acres of replanting plus new planting during the five year period from commencement. The material is to be sold at a nominal price and provision is made for training smallholders in the techniques of budgrafting and nursery work.

An outline of the plans under four headings is:

i. The supply of budwood of approved clones

ii. The supply of clonal seedlings grown from seeds of approved origin

iii. The development of an area capable of producing approved clonal seed in the future

iv. The training of young men from among the smallholder community in techniques required for the establishment and maintenance of young rubber areas.

Supply of budwood – The expansion of budwood nurseries on Agricultural Stations to 75 acres and the development of 75 acres of budwood nursery at Sungei Buloh by the Rubber Research Institute have been planned and allowance is made for necessary renovation and maintenance of all nursery areas. It is estimated that annual production from these nurseries will provide for the budgrafting of 37,500 acres of young rubber.

Clonal seedlings — Provision has been made for planting 62.5 acres of nursery each year with approved clonal seed. 25 acres of the annual allowance will be located on Agricultural Stations and 37.5 acres will be under the management of the Rubber Research Institute at Sungei Buloh. Approximately double the area to be planted each year must be available for the production of clonal seedling stumps to permit of annual planting of the required quantities.

PROVISION OF PLANTING MATERIAL

Clonal seed is to be secured from commercial plantings through agreement with the owners and a survey of mature budgrafted areas on large estates has been the responsibility of the Botanical Division, Rubber Research Institute. The scheme provides for the payment of royalty and collection and distribution charges on five million seeds. The measures planned for the production of clonal seedling stumps are estimated to provide for the planting of 12,500 acres annually with this type of material.

TABLE II shows the distribution of clonal seed for planting on Agricultural Stations and at Sungei Buloh from August to the end of the year. The distribution of clonal seedling stumps, from the Sungei Buloh nursery, to smallholders in the different States and Settlements is shown in the second column.

TABLE II: DISTRIBUTION OF CLONAL SEED AND SEEDLING STUMPS

State or Settlement	*Clonal seed supplied August/December 1949*	*Clonal seedling stumps from Sungei Buloh 1949*
Selangor	105,600	13,000
Negri Sembilan	54,200	–
Malacca	30,000	14,000
Perak	199,000	24,000
Johore	30,350	–
Pahang	24,070	29,000
Kedah & Perlis	60,000	19,500
Penang & P. Wellesley	20,000	12,100
Kelantan	100,000	–
Trengganu	5,000	3,000
Sungei Buloh	1,535,230	–
Total	2,163,450	114,600

Development of clonal seed garden — The plans for the full use of 200 acres of land reserved at Sungei Buloh for the nurseries under the management of the Rubber Research Institute include the establishment in the area of permanent rubber trees selected for the production of high yielding progeny. The selected clones are to be budgrafted on 'hedges' of rubber planted 60 feet apart with 4 feet between trees. Hedges will occupy one fifth of the available land which leaves sufficient area between hedges for the development of the budwood and clonal seedling nurseries referred to above. After the third year however some small contraction of

the space available for nurseries may be anticipated as a result of the spread of roots and crowns of the hedge planted rows. Clonal seed production from this area may commence about the sixth year from planting and such seed will be available in any further extension of plans for providing smallholders with approved planting material.

Provision of technical assistance — As a corollary to the increase in planting by smallholders and the aim for such areas to be established with approved high yielding trees, assistance and training in the techniques required must be provided for smallholders. A training scheme has therefore been planned in which fifty young men from rural districts can be accommodated in quarters on the R.R.I. Experiment Station. These men will receive instruction and practical experience in budgrafting nursery planting and maintenance of young areas planted with approved high yielding material. The length of these courses has not been finally determined but in view of the seasonal nature of many planting operations it is unlikely that more than two courses can be catered for in any one year.

SMALLHOLDERS' ADVISORY SERVICE

1950

RUBBER RESEARCH INSTITUTE OF MALAYA
KUALA LUMPUR

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CONTENTS

	Page
STAFF AND ORGANISATION	4
FIELD AND ADVISORY WORK	6
TAPPING	6
MANUFACTURE	6
CURING	7
PLANTING AND REPLANTING	8
PLANTING MATERIAL	10
REPLANTING DEMONSTRATIONS	11
R.R.I. SMALLHOLDING	12
PUBLICATIONS AND FILMS	13
Appendix	
PROVISION OF PLANTING MATERIAL	14

STAFF AND ORGANISATION

Supervision — The Smallholders' Advisory Officer Mr L.R. Davidson, the Assistant Smallholders' Advisory Officer Mr J.M.F. Greenwood, and the three Superintendent Rubber Instructors Mr G. Diaz at Kuala Lumpur, 'Che Hussein bin Haji Alang Samsuddin at Ipoh and 'Che Mohd Aris bin Ahmad Fathil at Johore Bahru, were on duty throughout the year. Mr L.R. Davidson spent the month of November on local leave and Mr J.M.F. Greenwood was on local leave for ten days in December. Over the whole year we have been able to maintain closer contact with our Rubber Instructors than at any period in the past. The position will however be further improved when expansion of the field staff justifies the appointment of Superintendent Rubber Instructors to areas where Rubber Instructors are still operating independantly. The assistance of officers of the Department of Agriculture in these areas is particularly helpful at the present time.

The improvement in the staff position on earlier years has allowed a commencement to be made on the provision of extension service aids for field staff, and work has been carried out in the production of instructional leaflets, posters and films.

Rubber Instructors – One Malay Instructor resigned to join the Federation Police Force and an Indian Instructor left to take up an appointment with the Labour Department. No new recruits were available from the College of Agriculture in 1950 but a pre war graduate Syed Mamdooh Wafa bin Syed Hashim was appointed in June and after training at the R.R.I. Experiment Station and in Johore, he was posted to Ipoh at the end of September.

'Che Mohd Johar bin Mohd Rashid was temporarily posted to Kelantan from May to September to assist with the initiation of a budding programme in Ulu Kelantan. Two transfers took place during the year 'Che Abdul Rahman bin Panjang Aris from Teluk Anson to Kota Bahru, and 'Che Kassim bin Hassan from Kota Bahru to Parit.

'Che Zakaria stationed at Tapah took over supervision of the Lower Perak District with the exception of the riverine mukims of Kampong Gajah and Pulau Tiga which were placed under the charge of 'Che Kassim at Parit. 'Che Ramli was absent from his station at Kuala Kangsar for periods totalling sixteen weeks when he assisted Mr J.M.F. Greenwood and members of the Malayan Film Unit working on the production of instructional films on rubber growing and production.

Rubber Demonstrators – Five resignations were recorded during the year and eight new men were engaged. The total number of Rubber Demonstrators at the end of the year was fortysix. Six

of our new Demonstrators took up their duties immediately upon the completion of a training course at Sungei Buloh under the Colonial Development and Welfare Scheme.

Alias bin Jamik, Rubber Demonstrator at Kajang was seconded to the R.R.I. Experiment Station from May until the end of the year to assist with the supervision of the training course on the government nursery at Sungei Buloh.

Course on Rubber at the College of Agriculture — During November 'Che Mohd Rouse bin Haji Mohd Amin and 'Che Osman bin Ismail assisted the staff of the College of Agriculture in organising a ten day course on rubber growing and production methods for students of both certificate and diploma courses.

VISITS BY SENIOR OFFICERS TO RUBBER INSTRUCTORS

Principal tours of districts made by the Smallholders' Advisory Officer and Assistant Smallholders' Advisory Officer were:

Negri Sembilan	May, June
Perak	January, March, April, May
Johore	September
Kedah & Perlis	January, May, June, September
Penang	September
Kelantan	June

Casual visits occupying a single day or less were made by both officers as occasion demanded in Selangor and Negri Sembilan. A large proportion of the visits by the Assistant Smallholders' Advisory Officer were in connection with the filming of our instructional films and this explains the excessive concentration on certain districts.

SMALLHOLDERS' RUBBER ADVISORY COMMITTEE

The ninth meeting of the committee was held at the Rubber Research Institute on 4 October when the draft estimates of expenditure for the year 1951 were considered. The significance of demonstration in an extension service was considered by the committee and the importance of adequate provision for this need stressed. Other subjects discussed included the supply of rubber planting material, earth in smoke house construction and the presentation of rubber prices in Malay broadcasts. Information on the future role of the Rural and Industrial Development Authority was provided by the Director of Agriculture.

Sample survey of yields on smallholdings in Johore — Progress in the identification of holdings for the survey has been slow because this work has to be done in the course of their normal duties

by Rubber Instructors and Agricultural Assistants. The emergency has made the task more difficult and has imposed limits on the areas which can be included. The survey will now be limited to 149 clusters totalling 745 holdings. These had all been identified by the end of the year and regular returns will be available during 1951. Returns covering varying periods in 1950 have been obtained from 385 holdings and passed to Ungku Aziz bin Abdul Hamid of the Economics Department of the University of Malaya who is undertaking analysis of the data.

FIELD AND ADVISORY WORK

TAPPING

The steady rise in the price of rubber from April onward has encouraged maximum tapping on smallholdings, generally with little consideration for the future productive capacity of the trees. After June tapping ladders and gouges lashed to poles became common devices for extracting latex from previously untapped bark. With the increased return from tapping, less skilled labour has been drawn to smallholdings and the incentive to high production has encouraged afternoon tapping on occasions and minimised the respite which trees normally obtain from wet days.

Applied to trees which at lower prices would be uneconomic producers, such intensive extractive practices could be commended as providing a means of accumulating reserves for the ultimate replanting of the areas. Many holdings with a previous potential productive life of some years have however been affected and the urgency for replanting has generally been increased by the intensive tapping practiced during the greater part of the year.

MANUFACTURE

The relatively new development of collection of smallholding latex at central points either for manufacture into smoked sheet in small factories or for transport to large processing plants, recorded in the 1949 report mainly in Kedah, has been introduced during the year to several parts of the country. The high price of rubber throughout the second half of the year prevented the establishment of sheet making factories by small business men because of the high working capital required and the feeling of insecurity in making purchases at high levels. Wherever an outlet for latex existed such units became sellers to larger organisations engaged in the production of latex concentrates, and extension of centralisation to new areas was only possible when such purchasers were available.

MANUFACTURE

Organisations commenced to function in Selangor, North Perak, Negri Sembilan and Johore while the project already described in Kedah steadily extended its sphere of operation. Progress in North Perak was not as good as had been hoped and though setbacks were experienced in the other States these were of a temporary nature only. In the last three months of the year monthly collections of latex recorded by Rubber Instructors averaged:

Kedak	70 tons
Selangor	45 ,,
Negri Sembilan	50 ,,
Johore	30 ,,

Experience of the schemes now functioning has shown that smallholders appreciate an outlet for their rubber as latex. They have generally received an equal or higher return for their produce in this way and there can be no doubt their rubber is exported as a higher quality material than if they manufacture roughly dried sheet rubber themselves. An objection to the system is the dependence of almost all organisations now receiving smallholders' latex on the world market for latex concentrates. The demand for latex has shown erratic fluctuations in the past and the producer is at the mercy of such factors as shipping shortages and interruption of handling facilities in the ports and installations of manufacturing countries. Protection for the very small rubber growers is required against sudden breakdowns in the market for their latex and it is hoped that this will be provided by the Rural and Industrial Development Authority which was established by Government in August 1950.

Standby facilities are required for the manufacture into smoked sheet or crepe of all smallholders' latex at present being sold to the concentrating organisations. Should the sale of latex become extensively adopted through well organised channels there can be no doubt that a large proportion of such processing facilities would be kept in operation. The price paid to smallholders would therefore have to be related to the average price of the various forms of rubber produced, and not to any premium product. The need for a central marketing organisation under the aegis of the Rural and Industrial Development Authority is therefore evident.

CURING

During the year we have endeavoured to apply information obtained by the Smallholders' Advisory Officer in Ceylon in the erection of mud and wattle smoke houses in places where collaboration of smallholders could be secured. Two such smoke houses designed

with a capacity of about 10 piculs of rubber have been erected at Kampong Tallang in Perak and at Beseri in Perlis. Difficulties have been experienced in the operation of these smoke houses largely by the excessive cracking resulting from inexperience of the mixing and application of mud, and the peculiarities of ventilation requirements. It is considered that these difficulties have been overcome but it is desirable that a mud and wattle smoke house should be built under conditions which will give us full opportunity for close supervision and comparison of mixing and building techniques.

PLANTING AND REPLANTING

In the 1949 report reference was made to the significance of the increase of replanting on holdings of the smallest category. At the beginning of 1950 it seemed probable that replanting on smallholdings would proceed at a greater rate than in previous years. In January and February felling of old rubber trees was carried out on many smallholdings in order to take advantage of the higher price for firewood and there appeared to be greater interest in replanting. With many smallholders however curiosity was centred on the assistance which might be expected from the Government. This interest was stimulated by the issue of a questionnaire on replanting by the *Rubber Smallholders' Enquiry Commission* in the last months of 1949 and the beginning of 1950.

The steady rise in the price of rubber from April onwards was the most notable reason for smallholders losing interest in replanting as an immediate requirement and attention was focussed on extracting the maximum income from old rubber trees. Those who had felled their trees precipitately expressed regret at having done so but the high price provided an inducement for the immediate planting up of such areas.

Acreages of new planting and replanting in the different States and Settlements, as they have been observed by Rubber Instructors are recorded in TABLE III in *S.H.A.S.*: '51.

The increase in replanting on previous years has resulted from replacement of existing old rubber trees while the planting of less than 1400 acres felled during the Japanese occupation is approximately the same as in 1948 & 1949. There is no doubt that the less expensive replanting propositions in this category of land had been planted up in earlier years and remaining areas had almost inevitably been abandoned to lalang.

The proportion of planting carried out on the smaller categories of holding has been more than maintained during 1950 and comparative figures for three years are:

	REPLANTING			NEW PLANTING		
	1948	1949	1950	1948	1949	1950
Less than 10 acres	47%	59%	64%	60%	83%	81%
10 – 25 acres	10%	14%	21%	13%	7%	14%
25 – 100 acres	43%	27%	15%	27%	10%	5%

These figures reflect the lack of faith in rubber as a long term investment by Indian and Chinese capitalists who are the principal owners of holdings between 25 and 100 acres. It is encouraging that the genuine smallholders, for whom the difficulties in undertaking planting of a semi permanent tree crop are so much greater, have shown greater interest in replanting.

Clonal seedling stumps produced under the Colonial Development and Welfare Scheme D.1176 were available to smallholders on a much larger scale than in 1949. The smallholder has shown a marked preference for this type of planting material and there are indications that the supply has actually stimulated planting. The seedling stump, generally self sown, has been the accustomed planting material of the smallholder, particularly of the Malay smallholder, and reports from Rubber Instructors on the establishment of areas with clonal seedling stumps have commonly shown that the percentage of casualties on the Malay holdings have been less than on Chinese and Indian holdings. This may be attributed

TABLE I: USE OF HIGH YIELDING PLANTING MATERIAL

State or Settlement	*Acres budgrafted*	*Acres planted with clonal seedlings*
Selangor	176	667
Negri Sembilan	200	305
Malacca	370	282
Perak	55	865
Johore	802	524
Pahang	15	1,315
Kedah & Perlis	101	461
Penang & P. Wellesley	237	288
Kelantan	340	20
Trengganu	18	137
Total	2,314	4,864

to familiarity with the material and also in part to the fact that more careful attention may be possible on the smaller Malay holdings during the critical first few weeks.

PLANTING MATERIAL

TABLE I indicates progress made during the year in the establishment of approved high yielding material on smallholdings.

In 1949 we recorded the planting of 1,090 acres with clonal seedling stumps out of total new planting and replanting amounting to 4,350 acres this would imply a balance of 3,260 acres to be budgrafted in 1950 and 1951. Although there is a considerable deficiency of budgrafting to be made good from earlier years the 1950 figures for budgrafting show improvement.

A comparison of areas budgrafted in relation to total planting in the different States and Settlements is made in TABLE II. In interpretation of these figures it should be noted that budgrafting may reasonably be carried out at any time between one year and two and a half years from planting. The table does not therefore give a precise indication of deficiency of budgrafting in any particular State or Settlement. It merely indicates a trend, for a proper appreciation of which it is necessary to have knowledge of the amounts of irregular new planting in certain districts, where budgrafting has been made a requirement prior to the issue of a title to the land.

TABLE II: COMPARISON OF FIELD BUDDING WITH NOMINAL THEORETICAL REQUIREMENTS

State or Settlement	*Total planting 1949*	*Clonal seedling planting 1949*	*Difference*	*Budgrafting 1950*
Selangor	551	169	382	176
Negri Sembilan	298	191	107	200
Malacca	561	117	444	370
Perak	656	217	439	55
Johore	906	66	840	802
Pahang	248	170	78	15
Kedah & Perlis	357	86	271	101
Penang & P. Wellesley	342	52	290	237
Kelantan	407	–	407	340
Trengganu	24	22	2	18
	4,350	1,090	3,260	2,314

PLANTING MATERIAL

The use of approved planting material on different categories of holding is:

		Budding	*Clonal seedling*
Replanting	less than 10 acres	438	1,869
	10 — 25 acres	148	330
	25 — 100 acres	396	123
	Total	982	2,322
New planting	less than 10 acres	1,127	2,351
	10 — 25 acres	111	163
	25 — 100 acres	94	28
	Total	1,332	2,542

REPLANTING DEMONSTRATIONS

We have followed the policy outlined in previous reports in the control of replanting demonstrations. Limitations of staff and the requirements of other work which has been considered to deserve priority has prevented any considerable extension of the number of demonstrations.

Two new demonstrations have been added in Perak but in that State a demonstration on a Chinese holding had to be abandoned because of lack of interest on the part of the owner. For the same reason a demonstration had to be abandoned in Kedah but a substitute was found nearby. Distribution of replanting demonstrations is:

	Malay	Chinese	Indian	*Total*
Selangor	4	1	1	6
Negri Sembilan	1	–	–	1
Perak	3	1	1	5
Kedah	4	–	–	4
Province Wellesley	1	1	–	2
Pahang	1	–	–	1
Totals	14	3	2	19

Planting materials, fertilizers and assistance in establishment and application have been provided for these areas as required.

In Johore the Department of Agriculture has decided to set up replanting trials in which the hedge planting system will be employed. The assistance of Superintendent Rubber Instructor and Rubber Instructors in Johore will be available to the Department in selecting suitable areas, in supervising operations and securing future maintenance of the areas.

R. R. I. SMALLHOLDING

Tapping of the two small plots of budgrafted trees in the Botanical Division's experiment has continued and yields have shown an inferior return at a greater cost of labour from the system designed to imitate common smallholder practice (S/3, 25d/30, 111%) in comparison with half spiral alternate daily (S/2, d/2, 100%).

Considerable trouble was experienced early in the year in the 1949 replantings because the poisoning of old trees was taken as an invitation to the local population to fell the dead trees. Further damage to the young growing plants resulted from the depredations of cattle and wild pig. Clonal seedling losses in the hedge planting were made good by the use of larger stumps as supplies. The orthodox planting in which budded stumps had been used had to be completely replanted with stumped buddings, which became available towards the end of August from a nursery on the building site for labourers quarters. This material was satisfactorily established.

In the area in lot 707 selected for replanting with hedges slaughter tapping of every third row was continued until September when felling commenced. These trees had provided a yield of which declined from 80% to 65% of the original production of the area. The intermediate rows which had been pollarded in December 1949 were reopened for tapping in September (S/2 D/2 100%), and the yield for December was approximately 40% of the original production of the area. Replanting was effected on the lines of the felled trees with budded stumps at 4 ft × 54 ft. Clones planted were RRI 500, 501, 509, 512, 513, 526, 527, and PR 107.

Available coffee seedlings have been planted out in hedge replantings at 8 ft intervals.

Extension of the nursery area at Ampang road has been carried out and the nursery now covers approximately half an acre. The new extension has been planted up with clonal seedlings at different planting distances and an area has been reserved for about 1,000 specially treated seedlings from the Botanical Division. The 1949 clonal seedling nursery has been partially cleared and has provided budded stumps for our replanting in addition to 800 clonal seedling stumps supplied to smallholders. Half of this area is being developed as a cover crop museum for the Pathological Division.

Building of labourers quarters in Lot 707 necessitated the removal of a small budwood nursery and the felling of some mature rubber trees including 14 budded trees in the Botanical Division tapping experiment.

PUBLICATIONS AND FILMS

COLLABORATION WITH the Department of Public Relations which was initiated in 1949 was continued throughout the year and acknowledgement is due to the Director of Public Relations and members of his staff for the assistance which they have given in designing and planning the layout of leaflets, in translating the English text provided into Malay (Jawi script) and Chinese, and in seeing the publications through the press.

The three following illustrated leaflets in our series designed to advise rubber growing smallholders on general and topical subjects were completed and distributed through Rubber Instructors and District Officers:

Rubber Growing for Malayan Smallholders

1. The present position
2. Improved planting material and its value
3. Replanting on smallholdings

The English text of two further leaflets was completed and these will be printed and available for distribution early in 1951:

4. Budgrafting
5. Centralised manufacture

A poster has been designed to illustrate the several steps in budgrafting. This is composed of a series of sixteen line drawings, illustrating the operations of budgrafting, examination and cutting back, arranged round a central drawing of a mature budgrafted tree. The clarity of the drawings, the work of Mr Hoh Choo Chuan, made it possible to keep the captions, in romanised Malay to a minimum. Two thousand copies of the poster have been printed and a certain number supplied to Rubber Instructors. Further distribution will be effected simultaneously with release of the leaflet No. 4 on Budgrafting.

Instructional films — From April field inspections for the location of sites and camera work proceeded intermittently as weather and seasonal operations permitted. By the end of the year suitable material for all films had been shot and the two parts dealing with manufacture, II. 'Manufacture of Sheet Rubber on Smallholdings' and VI. 'Centralised Manufacture' had been finally edited and the sound track of the commentary added. Credit titles which will be common to all films have still to be added and further editing and provision of commentaries for the other four films will be done early in 1951.

L.R. DAVIDSON
Smallholders' Advisory Officer

Kuala Lumpur
16 March 1951

PROVISION OF PLANTING MATERIAL FOR SMALLHOLDERS

A NOTE ON THE COLONIAL DEVELOPMENT AND WELFARE SCHEME D.1176

IN GENERAL, supplies of budwood have been sufficient to meet demands in all Territories. In Trengganu it has been possible to initiate budding on new plantings with budwood obtained from the Agricultural Station at Kuantan. Small demands for supplies of budwood of clones R.R.I. 501, G. 1 and P.B. 86 which could not be met locally were obtained from nurseries on the R.R.I. Experiment Station.

In the implementation of the Colonial Development and Welfare Scheme for the supply of planting material to smallholders the requirements for the provision of clonal seedling stumps has made the greatest demands on staff of the Rubber Research Institute. We have to acknowledge the assistance we have received from managements of collaborating estates in securing the necessary supplies of seed from areas which have been approved for seed production.

The short seeding season of 1950 was of very limited duration. Seed fall generally commenced during the second half of January and finished before the end of February. Apart from the small quantity, available seed was generally of low quality and poor germination was recorded. Supplies which were obtainable, totalling 628,300 seeds, were insufficient to meet the full demands of Agricultural Stations at this season but the resulting neccessity to obtain the greatest proportion of supplies from the excellent August to October season was certainly to the overall advantage of the scheme.

Collections from the main seed fall commenced on 27 July and for most of our sources the season finished in the second week of October. One estate however continued collections of seed until the end of the year, and these limited supplies were particularly valuable as they permitted final plantings and supplies on several stations during favourable planting weather.

At the height of the season, the end of August and beginning of September, supplies were much in excess of the quantities which could be conveniently handled on Agricultural Stations. We were reluctant to cut down collections in view of the large total requirements, the uncertainty as to the duration of the season, and the

importance of regular clean picking of areas to ensure good germination figures. All seed surplus to Agricultural Stations requirements was therefore forwarded to the Smallholders Nursery at Sungei Buloh, where the staff of the Experiment Station had to make strenuous efforts to utilize the seed without wastage. In one week over three tons (674,000 seed) were laid down in germination beds at Sungei Buloh.

Supplies of seed were made available for the nurseries at Kalumpang referred to in the 1949 annual report and this scheme was used as a model by the State Agricultural Officer in Kelantan who asked for supplies of seed for establishment in kampong nurseries under the control of Penggawas and Penghulus advised and assisted by Rubber Instructors and Rubber Demonstrators. The development of such nurseries will be watched with considerable interest. If smallholders can be assisted to grow their own clonal seedlings in kampong or mukim nurseries the task and cost of supplying planting material will be very much reduced.

At the end of the season almost all demands for seed had been met except that the scheme in Kelantan was commenced too late to allow development to the fullest possible extent and a late request for seed from Negri Sembilan could not be met before the end of the year. Distribution of seed to nurseries in the different States and Territories is shown in TABLE III.

Two distribution programmes for clonal seedling stumps from the Sungei Buloh nursery were carried out during the year using transport provided by the Department of Agriculture. In the March to April planting season supplies fell short of the estimate

TABLE III: DISTRIBUTION OF CLONAL SEED AND SEEDLING STUMPS

State or Settlement	*Clonal seed from estates*	*Clonal seedling stumps from Sungei Buloh*
Selangor	145,700	56,880
Negri Sembilan	120,000	30,000
Malacca	89,000	32,875
Perak	230,300	141,000
Johore	703,750	70,750
Pahang	360,300	267,000
Kedah & Perlis	120,500	55,710
Penang & P. Wellesley	60,300	53,400
Kelantan	286,100	–
Trengganu	71,300	30,000
Sungei Buloh	1,668,800	–
Kalumpang	127,000	–
Total	3,983,450	737,615

and only 167,000 stumps were obtained against an expectation of 250,000. Enforced postponement of planting at this season is not a serious matter, though considerable disappointment was expressed by the smallholders affected. The advantages of October planting on all inland soils are fewer casualties and more rapid and vigorous growth. Short planting season distributions will however have to be continued because limitations of labour and transport necessitate extension of the distribution season to the maximum.

During the period from mid-September to 7 December clonal seedling stumps were being despatched from Sungei Buloh at the rate of 50,000 per week. This raised the total number distributed during the year to 737,615 and details of the allocation to different States and Settlements are shown in TABLE III.

By the end of the season we had met all requirements of which reasonable warning had been received. Experience has shown however, that the large scale distribution of stumps stimulates planting and increases the demand.

SMALLHOLDERS' ADVISORY SERVICE 1951

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KUALA LUMPUR

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CONTENTS

	Page
STAFF AND ORGANISATION	4
RURAL AND INDUSTRIAL DEVELOPMENT AUTHORITY	8
SMALLHOLDERS' ASSOCIATIONS	9
ACKNOWLEDGEMENTS	10
FIELD AND ADVISORY WORK	10
TAPPING	10
MANUFACTURE	11
PLANTING AND REPLANTING	12
PLANTING MATERIAL	15
SIZE OF HOLDING	21
REPLANTING DEMONSTRATIONS	23
R.R.I. SMALLHOLDING	23
PUBLICATIONS, FILMS AND BROADCASTING	24
Appendix	
PROVISION OF PLANTING MATERIAL	26

STAFF AND ORGANISATION

Supervision — The two senior officers, Mr L.R. Davidson and Mr J.M.F. Greenwood were on duty throughout the year. Satisfactory contact was maintained with Rubber Instructors in all districts and progress continued in the provision of aids to supplement the normal extension work of Rubber Instructors. It should be mentioned that incidence of leave throughout the service in 1952 and 1953 will restrict the amount of work which can be undertaken in all fields.

Visits by the two senior officers to inspect work on smallholdings in various districts were:

Selangor	January, February, May, June, July, September
Negri Sembilan	May, July
Malacca	March, May, July
Perak	January, May, July, November
Johore	March, August
Pahang	June, August
Kedah	January, July, August, November
P. Wellesley	January, August, November
Kelantan	July, September
Trengganu	June, September

At the request of the North Borneo Rubber Fund Board the senior Smallholders' Advisory Officer undertook a visit to smallholding areas in the Colony with the object of advising on the organisation of an advisory service for smallholders in the Colony. The tour involved absence from Kuala Lumpur from 10 February to 25 March and a report was written and submitted to the Chairman of North Borneo Rubber Fund Board.

Three Superintendent Rubber Instructors were on duty in their respective stations throughout 1951. In March 'Che Mohd Aris bin Ahmad Fathil was nominated a smallholders' representative on the Rubber Producers' Council of Malaya. Subsequently, in October, 'Che Mohd Aris was elected President of the Johore Smallholders' Association at the inaugural meeting of that body.

Rubber Instructors — Two new Rubber Instructors were appointed at the beginning of May; Mr Aw Yong Kong Keong who had completed his training at the College of Agriculture, Serdang in April 1951, and Mr Chong Min Fatt who left the College in the previous year. After training they were posted respectively to Bukit Mertajam and Kluang at the beginning of July. Mr Chong Min Fatt was subsequently transferred to Batu Pahat because of the difficulty of obtaining satisfactory accommodation at Kluang.

Two Chinese Rubber Instructors resigned during the year. Mr Tang Hon Loong former Rubber Instructor at Kluang obtained a managerial post in a group of rubber estates. Mr Lee Yew Siong formerly Chinese Rubber Instructor at Seremban tendered his resignation while on specially accelerated leave on a British Council visitorship to England.

One of our Rubber Instructors, having undertaken voluntary part time duty in the organisation of Kampong Guards in his district, was released for full time duty with the State War Executive Committee from 1 March to 31 July. The State War Executive Committee were particularly appreciative of the assistance rendered.

Transfers made during the year were, Syed Mamdooh Wafa bin Syed Hashim from Ipoh to Pontian on 5 March, Abdul Aziz bin Pagon from Pontian to Temerloh on 5 April, Chan Seng Kiat from Nibong Tebal to Kuantan on 6 June, and Mohd Razalli bin Uda Yahya from Pekan to Kajang on 22 June.

'Che Zainal Abidin bin Baharuddin, Rubber Instructor Jitra, was temporarily transferred to Kelantan for five months, May to September 1951, and stationed at Pasir Mas.

Mr Chong Min Fatt suffered serious injury in a motor cycle accident in September and was unable to resume duty during the remainder of the year.

Towards the end of the year information was received that Mr Aw Yong Kong Keong had been awarded a Colonial Development and Welfare Scholarship commencing in 1952. The scholarship will be tenable for four years and will enable Mr Aw Yong Kong Keong to study botany for a B.Sc. degree at a university in Australia, New Zealand or the United Kingdom.

At the end of the year there were thirtyseven Rubber Instructors. The distribution of field staff is shown in TABLE I.

Rubber Demonstrators — The Rubber Demonstrator at Kinta, Ahmad Daniel bin Mohd Rashid died in October. Three Rubber Demonstrators resigned during the year and 'Che Alias bin Jamik of Ulu Langat ceased to be a Demonstrator on appointment to assist in the supervision of trainees on the smallholders' nurseries developed under the C.D.W. Scheme at the R.R.I. Experiment Station. Three Demonstrators were not re-engaged on completion of their periods of service and one who was on probation at the beginning of the year was not retained. One Rubber Demonstrator was dismissed. Seven new Rubber Demonstrators were engaged during the year and there were therefore fortythree Demonstrators in the service at the end of the year.

TABLE I: DISTRIBUTION OF FIELD STAFF AS AT 31 DECEMBER 1951

Territory	*Area of rubber Smallholdings**	*Supt. Rubber Instructors*	*Rubber Instructors*				*Rubber Demon-strators*	*Average acreage per Rubber Instructor*
			Malay	*Chinese*	*Indian*	*Total*		
Perak	278,454	1	4	2	1	7	6	39,779
Selangor	163,873	–	3	–	1	4	6	40,968
Negri Sembilan	125,341	1	2	–	1	3	2	36,083
Malacca	84,526	–	1	1†	–	2	–	42,263
Johore	534,729	1	3	4	1	8	9	66,841
Pahang	97,447	–	1	1	–	2	6	48,723
Kedah & Perlis	146,203	–	4	–	–	4	7	36,550
Kelantan	68,282	–	1	–	–	1	4	68,282
Trengganu	43,799	–	1	–	–	1	2	43,799
Penang & P. Wellesley	28,832	–	–	1	–	1	1	28,832
Singapore	8,387	–	–	–	–	–	–	–
		3	20	9	4	33	43	–
Leave	–	–	–	3	–	–	–	–
Experiment Station	–	–	1	–	–	–	–	–
Total	1,579,873	3	21	12	4	37	–	–

* *Figures taken from the Rubber Statistics Handbook 1951*

† *The Chinese R.I. in Malacca worked also in Negri Sembilan*

STAFF AND ORGANISATION

There has been delay in filling vacancies in the Rubber Demonstrators cadre because we have considered it desirable generally to adhere to the policy of appointing as Demonstrators only young men who have satisfactorily undergone a course of training at Sungei Buloh and who are residents of the districts in which they will have to work. It is expected that in 1952 and subsequent years it will be easier to get the men we require in the districts where they are wanted.

Rubber Instructors at R.R.I. Experiment Station—From April onwards, with the exception of the month of Ramadhan, Rubber Instructors were stationed in sequence at the R.R.I. Experiment Station.

It is necessary for a Rubber Instructor to be available to undertake supervision of the courses for training of kampong youths and to give lectures and instruction in Malay. At the same time Rubber Instructors benefit from direct experience of new developments at the Experiment Station. It is desirable that the Rubber Instructors should not be away from their own stations in excess of one month but, in exceptional circumstances, we were able to station 'Che Mohd Noordin bin Ahmad at Sungei Buloh from September until the end of the year.

RUBBER INSTRUCTORS' CONFERENCE

The second postwar conference of Rubber Instructors took place at the Rubber Research Institute from August 20 to 22. All Rubber Instructors attended and we had the benefit of the attendance of visitors from collaborating organisations at appropriate sessions of the meeting. The principal subjects of discussion were,

Extension Aids for Rubber Instructors
Planting and Planting Material
Centralised Processing of Smallholders' Latex

Under the first heading discussion covered the parts to be played in extension work by films, leaflets and broadcasting. The recently completed R.R.I. instructional films were viewed by Rubber Instructors at a first screening and members of the staff of the Malayan Film Unit assisted by answering questions and replying to criticisms. We were fortunate in the attendance of Mr J.N. McHugh, the Director of Information Services, and Mr D.J. Lyttle of the Department of Broadcasting to provide information on the use of printed matter and broadcasting respectively.

Planting and processing of rubber provided fields for Rubber Instructors to inform their colleagues of interesting developments and projects on which they had first hand information.

COURSE ON RUBBER AT THE COLLEGE OF AGRICULTURE

Three Rubber Instructors were again available to assist with the annual course on rubber at the College of Agriculture. This occupied ten days in November and the Rubber Instructors who attended were 'Che Shamsudin bin Mohd Arabee, 'Che Yahya bin Ma'amor and Mr Anthony G. Mak. At the conclusion of the course all students visited the R.R.I. Experiment Station, at Sungei Buloh, the Rubber Research Institute laboratories and the R.R.I. smallholding.

SMALLHOLDERS' RUBBER ADVISORY COMMITTEE

The tenth meeting of this Committee was held at the Rubber Research Institute on 17 October when the estimates of expenditure for the Smallholders' Advisory Service in 1952 were considered. Extension work and assistance required by smallholders, particularly in relation to requirements for planting material, were discussed. While it was considered that the efforts of the Department of Agriculture and the Rubber Research Institute were rightly being concentrated on assistance to the owners of the smallest category of holding it was agreed that supplies of budwood in official nurseries surplus to the needs of smallholders should, wherever possible, be made available to owners of 25 to 100 acres of rubber land.

The Committee considered the service's difficulties from shortages of housing in many districts. It was agreed that the Rubber Research Institute should build accommodation if necessary wherever Rubber Instructors are likely to be permanently stationed.

Sample survey of yields on smallholdings in Johore — Rubber Instructors in Johore have continued to obtain records from the selected sample of smallholdings established in 1950. These have been forwarded to the Economics Department of the University of Malaya.

RURAL AND INDUSTRIAL DEVELOPMENT AUTHORITY

Collaboration with the Rural and Industrial Development Authority, which was set up towards the end of 1950, increased during the year. The Rubber Research Institute has been represented on the Rubber Committee and Rubber Working Party of the Authority and a large part of the preliminary planning and provision of technical data for schemes connected with the manufacture of

smallholders' rubber has been undertaken by officers of the Rubber Research Institute. Staff of the Chemical Division, particularly the Chemical Engineers, have been called upon for assistance on several occasions, while the Smallholders' Advisory Service has undertaken the general correlation of technical information relating to the several schemes under consideration.

SMALLHOLDERS' ASSOCIATIONS

The movement among smallholders to form their own associations is one of considerable interest to an extension service such as ours. Much time is saved in instruction where people meet together to discuss their problems. Economic advantages from organised action should assist the progress of rubber smallholders on sound technical lines.

In 1949 a Smallholders' Association was formed in Ulu Langat and another had been formed at Kuala Brang early in 1951. These associations were on a district basis but such organisations may lead to a large movement. Rubber Instructors have kept in close touch with such developments in their respective districts.

The Johore Smallholders' Association was inaugurated in October and provided simultaneously a strong State central organisation with numerous active district branches. This has given a strong impetus to the movement in other parts of the country. A district association was later formed at Bukit Gantang in Perak. In Perak also there has been a movement, originating from the Parit district, to form a central organisation.

Two members of the staff of the Smallholders' Advisory Service have played important parts in the inauguration of the Johore Smallholders' Association and have felt obliged to accept executive positions in the organisation in order to assist in orderly and efficient development. 'Che Mohd Aris bin Ahmad Fathil, Superintendent Rubber Instructor, Johore, has been elected President of the Association and 'Che Mohd Jamli bin Hj. Mohd A. Wasi, Rubber Instructor, Batu Pahat has become General Secretary. The Board of the Rubber Research Institute has agreed to these officers continuing their respective official duties in the association for a trial period, but it is considered that staff of the Rubber Research Institute should assist such associations only in technical fields in which they are competent and in which their assistance is greatly needed. Rubber Instructors will not be allowed to accept executive positions in smallholders' associations in future but may serve as technical advisers.

ACKNOWLEDGEMENTS

WE HAVE TO ACKNOWLEDGE the assistance received from Agricultural Officers in all States and Settlements through their continued interest in our work. At headquarters we have appreciated the attention which the Director of Agriculture and the Chief Field Officer have always been willing to give to our problems.

Data recorded in these reports have been obtained from monthly statements of Rubber Instructors who maintain careful records of the developments with which they are in personal contact. It can be accepted as accurate so far as it goes, but our field staff is not yet able to cover adequately all areas of the country where smallholders' rubber is grown.

FIELD AND ADVISORY WORK

TAPPING

The emergency has had a considerable effect where large areas of rubber have been closed for production by total curfew. The total of these areas however has been a small proportion of the smallholders rubber land and hardly sufficient to explain a marked fall in the year's production of rubber by Malayan smallholders.

The effect of the emergency on rubber production has been rather the disorganisation of established routine in many different directions over a large proportion of the country's rubber. Resettlement of country dwellers removes smallholders and their tappers to some distance from their tasks; partial curfews prevent the early morning starts which were a feature of share tappers' methods; at the same time prohibition on carrying food to work in many districts reduces the working hours for tappers. These interferences with established practice on smallholdings result in lower output per man and per unit area and a noticeable effect on the production of the country might therefore be expected.

In those areas which are most accessible for tapping the price of rubber has been such as to induce a very high intensity of tapping. There is no doubt that as a result of this the productive capacity of the oldest smallholding rubber has declined. Possibly the capacity to produce rubber would be restored by a long rest, such as occurred in the period of the Japanese occupation, and might again result from a long period of low prices. There can be no doubt however, that the non-productive period would be better faced with replanted rubber with which other economic crops might be cultivated to produce some immediate return from the land.

TAPPING

It is unfortunate for the country and the individual smallholder that replanting of smallholdings will have to be undertaken intensively over a short period of years when the smallholders' production will be low. Hurried work, with skill and technical assistance inadequate for the work involved, will result in failure to obtain the maximum benefits from replanting.

MANUFACTURE

Many projects developed during the year which involved the collection of latex from smallholders for central processing. The greatest proportion of the latex involved in such schemes was collected by organisations interested in the production of latex concentrate. In Kedah, where the central collecting and processing station had been first developed and most widely adopted, these stations turned over to the sale of latex wherever a market offered. In other States, notably Selangor, Negri Sembilan and Johore, the first development was of stations initiated purely for the collection of liquid latex for concentration. The disadvantages of sole dependence on the liquid latex market became evident towards the middle of the year when the market for concentrate was considerably reduced. In one area in Selangor collections had to be reduced by half at short notice and equipment was not available for the immediate substitution of factory manufacture of smoked sheet. The earliest plan to initiate a R.I.D.A. scheme for centralised manufacture of smallholders' rubber at Grissek in Johore was based on the sale of latex to commercial organisations in the initial stages. This had to be abandoned while plans were worked out for the manufacture of smoked sheet in one large factory in the mukim.

After the middle of the year developments for the centralised processing of smallholders' latex took the form of establishment of factory organisations for the manufacture of smoked sheet. The amount of rubber collected from smallholders as latex, however, steadily declined until December when some improvement resulted from renewed demand for latex concentrates. An indication of the scale of rubber latex collections from smallholders is provided in TABLE II, which has been compiled from records made by Rubber Instructors.

The small cooperative factory at Kampong Tallang unfortunately ceased to operate owing to disagreement amongst the members but other small organisations developed in Perak at Dendang, Bendang Siam, Kampong Menora, Kampong Batu Hampar and Kampong Gajah; in Malacca at Sungei Buloh and in Johore at Pinang Seribu and Serom. One or two of these projects

were assisted with equipment lent by the Rubber Research Institute where this could conveniently be arranged.

TABLE II: RUBBER (IN TONS) COLLECTED FROM SMALLHOLDERS IN THE FORM OF LATEX AS RECORDED BY RUBBER INSTRUCTORS

State	*1st Quarter*	*2nd Quarter*	*3rd Quarter*	*4th Quarter*	*Total*
Kedah	365	348	231	209	1,153
Selangor	424	226	162	105	917
N. Sembilan	235	288	168	39	730
Johore	344	433	464	386	1,627
Perak	34	36	49	32	151
Total	1,402	1,331	1,074	771	4,578

Larger factories were established by enterprising individuals at Pandan and Segamat in Johore and at Ulu Langat in Selangor.

Special assistance has been given to R.I.D.A. when required in the investigation of the possibilities of central manufacture of smallholders' latex at Grissek in Johore, Ulu Langat in Selangor and Temerloh in Pahang.

PLANTING AND REPLANTING

Acreages of planting and replanting are given in TABLE III. The small increase in replanting results from increased replanting on the largest size of holding.

The addition to the replanting of areas felled during the Japanese occupation has been surprisingly maintained at the level of the past two years and the high price of rubber has evidently overcome earlier apathy and induced the replanting of some more of the derelict land. Since it may be difficult, after the elapse of more than six years, to determine whether replanting falls within the category of areas felled during the occupation, we do not propose to attempt to collect further separate data for these areas. Totals of areas felled between 1942 and 1945 and recorded as replanted by Rubber Instructors up to the end of 1951 are given in TABLE IV.

New planting has continued at an increased rate and is being undertaken almost exclusively in the smallest category of holding. The policy (and activity) of Land Offices are however reflected in the figures and it is difficult to assess what is the strength of the popular demand. Up-to-date the rate at which Land Offices have considered applications for land has limited the amount of legitimate rubber planting and the customary alienation of land in lots

TABLE III: REPLANTING AND NEW PLANTING BY SMALLHOLDERS SINCE 1945

Territory	1945-8		1949		1950		1951		Total	
	Re-	New	Re-	New	Re-	New	Re-	New	Re-	New
Selangor	1,571	369	449	102	525	324	402	246	2,947	1,041
Negri Sembilan	330	462	148	150	291	363	327	892	1,096	1,867
Malacca	515	482	169	392	336	227	663	110	1,683	1,211
Perak	621	7	632	24	923	81	888	134	3,064	246
Johore	2,040	129	349	557	513	589	578	1,189	3,480	2,464
Pahang	52	392	19	229	62	1,434	108	1,370	241	3,425
Kedah & Perlis	251	35	305	52	386	272	364	1,190	1,306	1,549
Penang & P. Wellesley	720	26	297	45	460	--	448	--	1,925	71
Kelantan	8	77	11	396	1	148	--	220	20	841
Trengganu	--	57	22	2	1	143	--	237	23	439

TABLE IV: REPLANTING OF AREAS FELLED DURING THE JAPANESE OCCUPATION

State or Settlement	Area of Smallholding* rubber felled during the occupation	Replanted					Percentage of felled area replanted
		1945 to 48	1949	1950	1951	Total	
Selangor	2,388	1,176	171	100	1	1,448	60.6
Negri Sembilan	1,327	85	24	40	75	224	16.9
Malacca	6,021	503	128	272	427	1,330	22.1
Perak	1,071	471	276	63	174	984	91.9
Johore	8,966	2,002	298	264	181	2,745	30.6
Pahang	218	13	–	–	2	15	6.9
Kedah & Perlis	2,179	153	188	189	179	709	32.5
Penang & P. Wellesley	3,095	666	275	460	439	1,840	59.5
Kelantan	3,066	8	6	1	–	15	.5
Trengganu	7	–	–	–	–	–	–
	28,338	5,077	1,366	1,389	1,478	9,310	32.9

* *Figures taken from Rubber Statistics Handbook*

of 3 to 5 acres has continued. It is unfortunately impracticable for us to collect statistics of new planting on a basis of total rubber land in the ownership of the planter rather than on the individual alienations.

Approximately 60% of all planting was carried out during the last three months of the year. Planting during the principal and most reliable rainy season is desirable and considerable improvement in practice has been noted in the past two years. It is probable that the most important contributory factor to this change has been the control of supplies and distribution of clonal seedlings by the Department of Agriculture and the Rubber Research Institute.

PLANTING MATERIAL

Our activities under this head have centred on assistance in the operation of the 'C.D. & W. Scheme D.1176' and these are recorded in the *Appendix* to this report. There are however certain aspects of general problems related to planting materials for smallholders which call for special comment.

Figures of total planting and the acreage planted with clonal seedlings (TABLE V) indicate the continued popularity of this material and further evidence of the relatively strong demand for clonal seedling stumps is obtained on almost all direct contacts with smallholder rubber growers. On the other hand, our very considerable efforts to encourage budgrafting, although coupled with plentiful supplies of cheap budwood, have resulted in much smaller acreages of budgrafted rubber trees.

TABLE V: USE OF HIGH YIELDING PLANTING MATERIAL

State/Settlement	*Area planted with clonal seedlings acres*	*Total area budgrafted acres*
Selangor	611	68
Negri Sembilan	682	185
Malacca	426	202
Perak	836	130
Johore	1,004	324
Pahang	1,279	12
Kedah/Perlis	686	894
Penang & P. Wellesley	180	49
Kelantan	188	298
Trengganu	237	6
	6,129	2,168

TABLE VI represents an attempt to assess the degree of success in securing the budgrafting of areas not planted with clonal seedlings. The 1950 acreages of total planting and clonal seedling planting, the difference between these figures, and the total acreage budgrafted in 1951 are given. The last two columns from a similar table given in the 1950 report are repeated in view of the fact that budgrafting may reasonably be carried out up to two and a half years after planting.

The figures give a superficial appearance of improvement in the unselected seedlings which have been budded but it is important to note that the area budgrafted in Kedah includes 650 acres of land which had been illegally planted prior to alienation and that such land has not been recorded in the planting figures for previous years. There may be other inclusions of a similar nature though they are not expected to be large and there is a possibility that some budgrafting has been done in areas which were planted with clonal seedlings. It is however possible that the acreage planted with clonal seedlings has been understated from lack of knowledge of the source of supply of seed which a smallholder may obtain privately from an estate.

A cautious conclusion from the figures is that about one third of the area which should be budgrafted remains as unselected seedling rubber. This shows some improvement on earlier practice as will be seen from a study of figures in TABLES III and VII.

There can be no doubt that the availability of supplies of good, well grown clonal seedlings has done much to stimulate, amongst smallholders, an interest in rubber planting at a time when the price of rubber is a serious deterrent to replanting. The demand for clonal seedlings tends to have been accepted as an indication of the smallholders' preference in planting material and there is a danger that it will be held to justify disproportionate attention to the provision of clonal seed for smallholders. The nature of the smallholders 'preference' requires careful examination.

The arguments put forward against budgrafts on smallholdings are mainly those which were advanced by practical planters twenty to thirty years ago when budgrafting of rubber trees as a plantation practice was in its infancy. They are that the budgraft is an 'unnatural' tree, a branch, with the bark of a branch and therefore not likely to stand up to tapping for the same number of years as a seedling tree. Budgrafts are now accepted by large estates and provide the trees for the greatest acreages of current replanting. If the life of a budgraft under continuous tapping is not as great as for a seedling tree (and of this we are not yet sure)

TABLE VI: COMPARISON OF FIELD BUDDING WITH NOMINAL THEORETICAL REQUIREMENTS

State or Settlement	*Total planting 1950*	*Clonal seedling planting 1950*	*Difference 1950*	*Budgrafting 1951*	*Difference 1949*	*Budgrafting 1950*
Selangor	849	629	182	68	382	176
Negri Sembilan	654	305	349	185	107	200
Malacca	563	282	281	202	444	370
Perak	1,004	865	139	130	439	55
Johore	1,102	524	578	324	840	802
Pahang	1,497	1,315	182	12	78	15
Kedah & Perlis	658	461	197	894	271	101
Penang & P. Wellesley	460	288	172	49	290	237
Kelantan	149	20	129	298	407	340
Trengganu	144	137	7	6	2	18
Total	7,080	4,826	2,216	2,168	3,260	2,314

TABLE VII: ACREAGES PLANTED WITH CLONAL SEEDLINGS AND BUDGRAFTED

State & Settlement	Planted with clonal seedling				Budgrafted				
	1949	1950	1951	Total	1948	1949	1950	1951	Total
Selangor	169	629	611	1,409	147	278	176	68	669
Negri Sembilan	191	305	682	1,178	65	73	200	185	523
Malacca	117	282	426	825	445	305	370	202	1,322
Perak	217	865	836	1,918	57	196	55	130	438
Johore	66	524	1,004	1,594	450	395	802	324	1,971
Pahang	170	1,315	1,279	2,764	7	10	15	12	44
Kedah & Perlis	86	461	686	1,233	33	42	101	894	1,070
Penang & P. Wellesley	52	288	180	520	158	88	237	49	532
Kelantan	–	20	188	208	2	76	340	298	716
Trengganu	22	137	237	396	–	17	18	6	41
	1,090	4,826	6,129	12,045	1,364	1,480	2,314	2,168	7,326

it is considered adequate to take the maximum commercial advantage from the continued development of new planting material.

The smallholder in general does not like the additional work involved in budgrafting and the maintenance of the young budgrafted trees. Particularly he dislikes the cutting back of a vigorous young plant to nearly ground level and the presumed sacrifice of a year's growth. It is held by many that young budgrafts will not stand the smallholders 'methods' of tapping while it appears to be assumed that the clonal seedling will do so. There is quite insufficient evidence from mature areas of either type of material in smallholders' hands or in other hands for that matter, on which conclusions of this kind can be justified and future action must be guided to a certain extent by such information as is available from large estates. This suggests that both budgrafts and clonal seedlings are subject to physiological unbalance more readily than the average of unselected seedling trees, and in general the incidence of brown bast is higher amongst both clonal seedlings and budgrafts than in unselected seedling areas. This is considered to be a direct consequence of their higher yielding properties: brown bast incidence also increases, in all trees, with increase in tapping intensity.

The smallholder generally taps a cut of less than half circumference daily for lengthy periods and he *may* tap his trees from 250 to over 300 times per annum. This contrasts with the half-spiral alternate-daily system usual on estates and under which trees are tapped about 160 times per year. If brown bast is high with budgrafts and clonal seedlings on the latter system it is likely to be more serious under smallholders' methods and the good clonal seedlings are known to be more susceptible to brown bast than any of the clones recommended for budgrafting on smallholdings.

A further comparison between clonal seedlings and budgrafted trees requires consideration. It is frequently urged that the corky seedling bark of the former is more suitable for the smallholder, the assumption being that the smallholder tapper is less skilled than the estate labourer. This ignores the fact that the thinner bark of budgrafts is uniform in thickness and texture for all trees of one clone under comparable conditions. Smallholders have shown surprising ability to tap very thin bark on their own holdings and in many districts they tap budded estate rubber hardly less skilfully than resident labourers.

The foregoing considerations suggest that for the often heard comment that clonal seedlings are the best material for smallholders there may be no foundation; if smallholders are going to establish high yielding trees of any description they should, and undoubtedly will, alter their methods of tapping to the systems which have proved satisfactory for their material. Any failure to do this may have a more damaging effect on clonal seedlings than on budgrafts. In the meantime it seems to be necessary to take steps to enable the smallholder to form a really well founded preference, based on actual experience of the two types of planting material, by continuing to make both types available and to use all possible means to secure the establishment on smallholdings of at least equal areas of budgrafts and clonal seedlings. Such a policy would be in keeping with the supplies of planting material available and the possibilities for extension of supplies of budwood and clonal seeds.

In the *Appendix* the relative scarcity of supplies of suitable clonal seed for smallholders is noted. The general method of supplying clonal seedling material as clonal seedling stumps, and the trials in which clonal seed has been supplied direct to smallholders, are described. The supply of clonal seed—germinated or ungerminated—direct to smallholders would be the most satisfactory and economical method of satisfying their needs. But reliable material is scarce and distribution of seeds may be so wasteful as to be justifiable only when plentiful supplies of good clonal seeds are available at economic prices. So long as supplies are limited, direct supply of seeds should be adopted with caution and only when the industry and conscientiousness of the recipients ensures that the material will be satisfactorily used. There are however certain areas to which the transport of clonal seedling stumps is so expensive as to be impracticable, and supply of seed to smallholders in such cases is the only satisfactory method of meeting the demand for seedlings.

The best guarantee of satisfactory use of seed by smallholders should be obtained when the nursery requirements for a district, mukim or kampong can be provided by the smallholders acting together. Smallholders' Associations and cooperative enterprises may have an important part to play in this respect and the penggawas and penghulus in Kelantan and the Smallholders' Associations in Johore and Trengganu are showing what can be done by good leadership.

SIZE OF HOLDING

Such information on size of holding as can be found from official statistics indicates that there are nearly one million acres of rubber land divided into holdings of 25 acres or less. Since it is estimated that there are about 350,000 holdings, the average size of holding must be less than 3 acres. This reckoning, however, takes no account of single ownership of several holdings or lots of land which are registered separately and on this aspect the available statistics provide no information. The experience of field workers is that such composite holdings are not unusual and the amount contributed to the total acreage of the country may be substantial.

The common practice of land alienation, which has presumably been followed since before rubber trees were grown in Malaya, is to divide land into 3 or 5 acre lots or, in Kedah, Kelantan and Trengganu in lots of 3 or 5 relongs*. Since no man is likely to get more than one lot in any land alienation scheme and the common inheritance procedure may lead to division of land, the occurrence of holdings of less than 5 acres is understandable.

It seems reasonable to visualise the great majority of smallholders as residing on holdings of about 3 acres, and therefore *the greater part of the livelihood of such families must obviously come from other sources.* In the more rural districts some individuals may have acquired additional land in one or more lots as the jungle has been pushed back and the land alienated in a gradually increasing arc from the original kampong. Other land in single ownership is acquired by purchase by the more wealthy who may obtain land in several mukims or even in different districts, and by inheritance.

The small size of holding has had a considerable influence on the system of harvesting rubber and appears to be a principal reason for the system of share tapping in which owner and tapper agree to divide the crop equally or in proportions which are less favourable to the owner.

Three acres of old seedling rubber hardly provide a tapping task for an adult worker particularly when it is tapped on the short single cut, intensive system of the smallholder which results in a high proportion of trees out of tapping at any one time. A smallholder may therefore see good reason to have his tapping done by a professional tapper who can usually fill up his requirements for full employment by a similar agreement with a neighbouring smallholder.

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* *1 relong = 0.17 acre*

Share tapping is generally destructive to the trees because of the principal interest to the tapper of immediate yield. It accounts for the poor state of trees on very many smallholdings. It provides, furthermore, a relatively poor return to the proprietor and results in inflation of production costs for all sections of the industry. The conclusion appears justifiable that an increase in size of holdings, were this possible, would result in improved methods of smallholders' production of rubber.

In another context (under Planting Material) reference is made to the changes which are required in smallholders' methods of production if the advantages of modern high yielding rubber trees are not to be lost to the smallholder. The need for tapping such rubber at an intensity not greater than the half circumference alternate daily system and acceptance of the fact that replanting is a recurrent necessity in rubber production give some indication of the minimum unit for rubber production.

A holding should provide two tapping tasks so that continuous work is available for at least one of the principal breadwinners of the family. Three acres of well planted rubber is the minimum to provide a single full tapping task and a holding should therefore have at least six acres of productive rubber. As a reasonable provision for replanting, allowance should be made for one quarter of the rubber being continuously out of production. Eight acres of rubber land would therefore provide a reasonable holding for a small family but if diversification of agriculture proves feasible in this country alienation of land in lots of 10 – 15 acres would appear to be well justified.

It is appreciated that no revolutionary change in the size of unit for the rubber growing smallholder can be quickly achieved for the whole country. It might however be reasonable if future land alienations could be made on a basis which offered the participants the best chance of success as rubber growers along with means to grow other crops, and in these larger alienations it would have to be accepted that rapid establishment of rubber throughout a new holding is neither necessary nor desirable. Careful selection of applicants for land on evidence of energy and farming ability is desirable and if this were practised in new land alienations examples could be created which might in the future result in suitable amalgamation of old holdings by purchase or by other means, and lead to a gradual increase in efficiency of production.

REPLANTING DEMONSTRATIONS ON SMALLHOLDINGS

There has been a net loss of two demonstrations during the year. In one case the plot fell within a resettlement scheme and the other had to be abandoned because satisfactory collaboration could not be obtained from the owner and routine maintenance was inadequate. There has been no extension of the number of demonstration plots because in nearly all districts where replanting is of immediate importance sufficient work is being done by smallholders to keep Rubber Instructors fully occupied and to provide locations for demonstrations of approved practices.

Of the seventeen demonstrations established mainly in 1949 or earlier, ten were provided with fertilizers, two were budgrafted and three were provided with seed of creeping leguminous covers for establishment on the conclusion of inter-row cultivation of vegetables.

THE R.R.I. SMALLHOLDING, AMPANG

Areas replanted before the war with budgrafts of Tj.1 and Pil.B.84 have continued to be tapped according to the requirements of the Botanical Division's experiment in which S/2, D/2 100% is being compared with S/3, 25D/30, 111%.

A small plot of Tj. 1 is still untapped although eleven years old. The seventy odd trees are being maintained against possible requirements of the Chemical Division for latex from virgin trees.

Only three acres of the holding now remain in which no replanting has been undertaken. This area will be kept in tapping as long as possible to supply fresh seedling latex for the Chemical Division. It is, however, doubtful if bark reserves are sufficient for tapping beyond the end of 1952.

The 1948, 1949 and 1950 hedge plantings have shown that the system permits crop to be obtained from at least a proportion of the old trees during a part of the period of immaturity. Girth measurements in the 1948 and 1949 hedges will be taken at six monthly intervals to determine when further destruction of the old trees remaining between hedges is necesary to permit satisfactory development of the young trees.

Periodic recording of the yield of the pollarded old trees in the 1950 hedge planted area has shown that yield averaged about 40% of the yield of the area before replanting was initiated in 1949. A decline to 31% was however recorded in the last two months of the year.

The half acre nursery area at Ampang Road has been intensively managed and has provided 14,500 clonal seedling stumps for distribution. An area of the clonal seedling section had been ear-marked for a budwood multiplication nursery and about 1,500 plants were left in this area to provide stocks for budding. In addition seedlings of special interest to the Botanical Division have been maintained in the area, and an area has been planted with young seedlings to provide a special budwood nursery for the Division.

The cover crop 'museum' has been extended during the year and now contains a fairly representative collection of the leguminous covers available in this country.

PUBLICATIONS, FILMS AND BROADCASTING

THE SERIES of leaflets entitled 'Rubber Growing for Malayan Smallholders', planned in collaboration with the Department of Information (former Public Relations Department) in 1950, was completed with the publication during the first half of the year of the last two leaflets:

4. Budgrafting
5. Centralised Manufacture

These leaflets were published in Malay (Jawi script), and Chinese, and a limited number of copies of the English text of the fifth leaflet were printed for supply to officers of the Rural and Industrial Development Authority.

Further publications undertaken during the year were produced entirely by Rubber Research Institute staff.

A manual on 'Control of Root Disease in Young Rubber' was published as *Smallholders' Advisory Service Publication No. 3* as a continuation of the series which commenced before the war with the publication of vernacular editions of Planting Manuals No. 7 and 8. Mr Greenwood in consultation with the Pathological Division compiled this booklet in which the text was kept to a minimum and full use made of photographs for illustrations. These were specially taken for the publication by Mr Hoh Choo Chuan. Translations were prepared in Malay by Tuan Syed Mamdooh Wafa, in Chinese by Mr Low Kai Choy, and in Tamil by Mr S. Karalasingam (Botanical Division).

As No. 4 in this series, the publication of a Malay edition of Communication 268 of the *Journal of the Rubber Research Institute of Malaya* was completed. The Malay text was prepared by 'Che Mohd Rouse bin Haji Mohd Amin.

At the Rubber Instructors' Conference in August general approval was expressed for the style of S.H.A.S. Publication No. 3 which was considered the most easily intelligible to the smallholder. The poster on budgrafting prepared in 1950 was also considered particularly suitable because of the detailed illustration of every stage by drawings. Rubber Instructors were generally of the opinion that coloured illustrations would be especially valuable in stimulating smallholders' interest in the subject matter.

For these reasons it was decided to prepare a manual on budgrafting based on a coloured edition of the line drawings used in the poster. Translation of the limited text was undertaken by the same persons as for S.H.A.S. Publication No. 3 and the material for the manual 'Budgrafting', S.H.A.S. Publication No. 5 was passed to the printer in December. It will be published in two editions, one containing text in Malay and Chinese and the other in Tamil and English.

Instructional Films — Commentaries for the four films were completed in the first quarter of the year but final editing of the films was delayed by the large volume of emergency work which had to be undertaken by the Malayan Film Unit.

The first show copies of the six films were completed for a first screening at the Odeon Cinema on 20 August. All Rubber Instructors attended this screening as well as students from the College of Agriculture and trainees in residence at Sungei Buloh at the time. Guests were invited from Departments and organisations whose work is closely allied to our own. These included the Departments of Agriculture, Cooperative Development, Information and Broadcasting and the Rural and Industrial Development Authority.

Minor changes were required in some of the films and when these had been completed the negatives were sent to Australia for reduction printing. 16 m.m. copies should be available for screening by the mobile units of the Department of Information early in 1952.

Broadcasts — The initiation of special programmes for rural audiences, designed particularly for the community listening service, provided the opportunity for renewed collaboration with the Department of Broadcasting in the provision of material of special interest to rubber smallholders. Members of the staff of the Malay

and Chinese rooms at Radio Malaya were taken on visits to the R.R.I. Experiment Station and to projects in various parts of the country likely to be of special interest to rubber smallholders.

Four talks were recorded in August and September:

Budgrafted Rubber
Inche Mohd Salleh (Radio Malaya)

Clonal Seedlings
Inche Mohd Salleh (Radio Malaya)

Organisation of Latex Collection from Smallholders
Inche Abdul Rahman bin Hj. Daud
(Rubber Instructor Taiping)

Centralised Manufacture of Sheet Rubber
Inche Hussein bin Hj. A. Samsuddin
(Superintendent Rubber Instructor Perak)

L.R. DAVIDSON
Smallholders' Advisory Officer

Kuala Lumpur
20 February 1952

Appendix

PROVISION OF PLANTING MATERIAL FOR SMALLHOLDERS

A NOTE ON THE COLONIAL DEVELOPMENT AND WELFARE SCHEME D.1176

R.R.I. COOPERATION with the Department of Agriculture in carrying out the requirements of the scheme has been continued during 1951. The main part of the Rubber Research Institute share in this project is carried out by staff of the Smallholders' Advisory Service and the R.R.I. Experiment Station with the advice and assistance of the Botanical Division.

1951 is the second complete year since the scheme received approval and the first therefore in which the full benefits of the undertaking might be expected to be available to smallholders. Within the limits set by the approved plans the results may be considered relatively satisfactory.

The plans relating to the immediate supply of planting material provided, in brief, for

1 the rehabilitation or establishment and the maintenance of 150 acres of budwood nursery of which 75 acres would be

located at the R.R.I. Experiment Station and the balance at Agricultural Stations;

2 the planting annually of 62½ acres of clonal seedling nursery of which 37½ acres would be located on the R.R.I. Experiment Station and the balance on Agricultural Stations. A total of 125 acres of nursery was considered necessary for this purpose;

3 the collection and utilization, in the nurseries provided for in 2 above, of 5,000,000 clonal seeds;

4 the training of young men from the kampongs in sound practical methods related to rubber growing and production.

Budwood Nurseries — Demands on the Rubber Research Institute for budwood for field budding on smallholdings have been small at 2,075 yards. Supplies of budwood from earlier established nursery areas on the Experiment Station have however been extensively used for budding further areas in the multiplication nursery. Of the 67½ acres available for budwood multiplication 65.5 acres had been budded at the end of 1951 and the balance will be completed early in 1952. Plentiful supplies of budwood of Tj. 1, P.B. 86, R.R.I. 501 and G. 1 will therefore be available in 1952.

Clonal seed supplies and clonal seedling production — The acreages planted with clonal seeds at Sungei Buloh each year since 1948 as shown in the reports of the Manager of the R.R.I. Experiment Station are quoted below. It should be noted that collection of clonal seed and establishment of nurseries commenced in July 1948 one year before approval for the Colonial Development and Welfare Scheme.

1948	12 acres
1949	42½ „
1950	41½ „
1951	25 „

In August 1951 it was decided that no restriction should be observed in the quantity of clonal seeds collected. It was also considered desirable that Agricultural Officers should feel that no limitation of seed supplies should prevent them from cultivating and planting the maximum areas of clonal seedling nurseries in their districts. Priority in the supply of clonal seed was therefore given to Agricultural Station nurseries, and planting at the R.R.I. Experiment Station was done only when supplies were in excess of Agricultural Station requirements. Of the 25 acres at Sungei Buloh 17 acres were planted in October.

First attention to the planting of Agricultural Station nurseries is justified by the high cost of distributing clonal seedling stumps and the declining fertility of the nursery area at the R.R.I. Experiment Station which was revealed in the growth of second crops of clonal seedlings. It has been considered that future plans for the provision of clonal seedling stumps for smallholders should provide relatively large nurseries suitably located to minimise distribution costs and on soil which will stand continuous cropping with rubber seedlings. The latter requirement indicates well drained peat clay soils likely to be found in coastal areas.

We are grateful to the managements of the relatively small number of estates which have collaborated with us to provide the seed supplies in 1951.

The first six months of the year produced a small steady supply of seed and the amount collected was limited by the relatively small planting requirements at that season of the year. Slightly more than three quarters of a million seeds were obtained and the million mark might have been reached had demand been stronger.

The principal seeding season was approximately a month later than in 1950 as result of the abnormally late wintering. The maximum possible amount of seed was collected and efforts were made to increase the number of sources of supply. There are however a number of qualifications in the requirements for any seed producing area to be secured for the C.D. & W. Scheme which restrict extension; the area of suitable budded rubber must be relatively large, the undergrowth should be sparse, and an estate is unlikely to accept the terms offered under the C.D. & W. Scheme if it is already undertaking commercial sales of clonal seed.

The differences in time of the main seasons of seedfall in 1950 and 1951 are listed below. The general pattern is however consistent in the two seasons and the table brings out clearly the high peak of supply, which occurs during about three weeks, which may yield approximately one half of the season's seed supply. This is a factor which must be given careful consideration in any plans for increasing the supply of seed to smallholders.

Seed in 1951 was generally of excellent quality and the unusual coincidence of the main seedfall with good planting conditions has favoured nursery establishment. Good stumps available in 1952 should therefore form a higher percentage of the seed utilized than in any previous year. The considerable increase in supplies in the last two weeks of December was rather exceptional.

RECORD OF SEED COLLECTIONS JULY TO DECEMBER 1950 AND 1951

Period	*1950*	*1951*
18 – 24 July	18,000	–
25 – 31	22,000	–
1 – 6 August	79,200	–
7 – 13	40,280	10,500
14 – 20	147,240	27,300
21 – 27	96,425	58,400
28 – 3 September	595,105	47,100
4 – 10	1,121,700	57,300
11 – 17	219,800	86,200
18 – 24	241,500	229,000
25 – 1 October	414,700	533,600
2 – 8	189,500	649,670
9 – 15	47,000	1,439,290
16 – 22	33,500	616,220
23 – 29	25,000	163,170
30 – 5 November	25,000	38,260
6 – 12	25,000	94,300
13 – 19	–	20,800
20 – 26	25,000	36,750
27 – 3 December	–	12,950
4 – 10	39,800	26,000
11 – 17	10,700	10,800
18 – 24	14,000	176,300
25 – 31	31,000	203,300
Total	3,461,450	4,537,210

The distribution of seed supplies to the different States and Settlements and the quantity used on the smallholders' nursery at the R.R.I. Experiment Station are shown in TABLE VIII. The latter quantity includes 323,900 seed collected on the Experiment Station.

TABLE VIII: DISTRIBUTION OF CLONAL SEED AND SEEDLING STUMPS

State or Settlement	*Clonal seed for estates*	*Clonal seedling stumps from Sungei Buloh*
Selangor	213,090	51,000
Negri Sembilan	140,910	51,200
Malacca	148,140	41,000
Perak	792,420	120,000
Johore	694,080	211,000
Pahang	913,530	182,600
Kedah & Perlis	646,000	92,000
Penang & P. Wellesley	61,400	60,000
Kelantan	597,860	–
Trengganu	261,940	54,000
Sungei Buloh	1,164,340	–
Total	5,633,710	862,800

The seed supplies to States and Settlements have not all been used on Agricultural Station nurseries, and the idea first applied in the development at Kalumpang, referred to in the report for 1949, of smallholders being assisted to grow their own clonal seedling stumps has been continued in Kelantan and introduced in Pahang, Trengganu, Johore, Perak and Kedah as supplies of seed have permitted.

The writer had the opportunity to inspect a large number of the smallholders' nurseries in Kelantan in July. These had been established for periods of from three to nine months. Maintenance was variable and was poorest in the younger nurseries and a satisfactory output of clonal seedlings from these nurseries would be dependent on subsequent action by smallholders to bring the maintenance up to standard.

Distribution of clonal seedling stumps took place in two seasons extending from the middle of March to the end of April and from the middle of September to the end of the first week of December. During these two periods lorries of the Agricultural Department's Transport Pool made five trips a week from the R.R.I. Experiment Station carrying 10,000 stumps or more on each occasion. In this way clonal seedling stumps were supplied to every State and Settlement except Kelantan and these stumps were additional to the supplies available from Agricultural Stations in all areas. In allocating supplies from the Rubber Research Institute an attempt was made to supply an equitable proportion of each district's requirements and at the same time arrange the supply at reasonable planting seasons. On this account supplies during the March April season, when planting conditions are less favourable went primarily to coastal areas while the inland areas most susceptible to drought received supplies only in the main planting season.

Future supplies of planting material — The Colonial Development and Welfare Scheme as originally conceived contained provision for a future independent source of clonal seed which can be relied upon to produce high yielding rubber trees. This is to be developed from the nursery areas at the R.R.I. Experiment Station by the establishment of close planted hedges at 60 ft intervals. The hedges have been budgrafted with a sequence of approved clones designed to give the maximum of cross pollination for seed production purposes consistent with the use of the hedge planting system which is necessitated by the preliminary use of the land for nurseries. Each approved clone is budgrafted at not more than

three consecutive points along a hedge. Clones used in two sections of the garden are noted below:

Section 1. Tj 1, RRI 501, PR 107, TK 14 & BR 2.
" 2. Tj 1, BR 2, PB 49, Avros 157 & RRI 509.

Seed production from this seed garden might be expected to commence about 1954 and the area should eventually provide over two million seed per annum.

The popularity of clonal seedlings as planting material amongst smallholders, the probable future increase in planting and the difficulty of securing adequate supplies from commercial sources, except at excessive prices, have suggested that further establishment of areas for clonal seed production should be undertaken in areas which can be controlled for the benefit of smallholders.

Areas where either new planting or replanting is being undertaken in large compact blocks in the region of 200 acres or more are suitable for development into seed gardens. Seed production will of course be subsidiary to the main function of rubber production for the owners of the individual holdings and the systematic mixing of clones, desirable for maximum seed production, will not be attempted while clones must be selected for yield and general characters as well as for good progeny. Clones Tj 1, RRI 501, and PR 107 suggest themselves for these gardens and it will probably be satisfactory to limit to one the number of clones on any holding of 5 acres or less. A further advantage of the establishment of seed gardens on land occupied by smallholders may be expected from the availability of an economic source of labour in the smallholders' families for the collection of seed. The areas will also provide smallholders with experience in the maintenance and tapping of their own budgrafted trees.

The first area to be selected for the purpose has been an area of 177 acres at Kampong Romania in the district of Temerloh. The owners of the land have indicated their willingness to have budgrafted rubber trees of the selected clones and in return for the budgrafting of the area, which will be carried out with funds from the Colonial Development and Welfare Scheme, they have undertaken to make available to Government all future seed supplies from the area. The area has been planted with ordinary seedling stumps and a small budwood nursery has been established with budded stumps from the R.R.I. Experiment Station.

A further possible seed producing area may be developed with the large rubber area of the land colonisation scheme at Sungei Durian in Perak.

Provision of technical assistance — In 1950 accommodation had not yet been built at Sungei Buloh to allow for the implementation of the scheme for training young men from kampongs in the practical aspects of growing and producing rubber. A small start had however been made using the limited R.R.I. hostel accommodation and two courses each for a group of ten young men had been started in succession. The second of these terminated in February 1951 and altogether 17 persons had attended the two courses.

The special accommodation built with Colonial Development and Welfare Funds at Sungei Buloh became available later in the year and in the middle of April it was possible to provide for 25 trainees. Only 23 men attended at this time and these commenced training on April 16. This course was interrupted by the fasting month when the trainees, of whom 22 were Malay, wished to return to their homes. On the resumption of the course accommodation was available for a further 17 trainees but only 14 were selected and sent to Sungei Buloh by the State and Settlement authorities.

The two groups of young men completed their training successively at the end of October and during December. All were subject to practical and oral tests and special attention was given to the important question of their skill in budgrafting. They received graded certificates according to their skill and knowledge and the numbers in each category are recorded below.

Grade		Budgrafting	General
I	Very Good	2	3
II	Good	23	19
III	Satisfactory	12	11
IV	Below Standard	—	4

Difficulties in the organisation of these courses arise from our inability to maintain unchanged supervision since Rubber Instructors cannot generally be spared from their stations for periods longer than one month. The seasonal nature of much of the work on which instruction has to be provided precludes adherence to a rigid programme. It has however been possible to provide a flexible training schedule in which proportional time is allocated to each subject. The difficulties of lack of continuity in supervision have been reduced by the provision of a series of printed lecture notes in romanised Malay which with the past programme of work will keep successive Rubber Instructors informed of teaching requirements.

In future it has been decided that two courses each of four and a half months duration shall be held during a twelve month period and these shall be arranged so that the month of Ramadhan is not included.